Scientific American.

THE ADVOCATE OF INDUSTRY AND JOURNAL OF SCIENTIFIC, MECHANICAL AND OTHER IMPROVEMENTS.

VOL. 2. NEW YORK, NOVEMBER 14, 1846. NO. 8.

THE NEW YORK

SCIENTIFIC AMERICAN:

Published Weekly at 128 Fulton Street, (Sun Building,) New York.

BY MUNN & COMPANY.

RUFUS PORTER, EDITOR.

TERMS.—$2 a year—$1 in advance, and the remainder in 6 months.

☞ *See Advertisement on last page.*

Parody on the Star-Spangled Banner.

Oh, say can you see by the "signs of the times."
That men are reforming, themselves setting free
From all that destroys their bodies and minds,
Resolving to plant a new liberty tree,
Their condition no more
They lament and deplore,
Their bondage is broken,
Their thraldom is o'er;
For the Temperance Banner
In triumph doth wave
O'er the heads of the rescued,
Free sons of the brave.

In the past, plenty seen thro' the midst of their tears,
Is the sorrow, the anguish, and pain they have suffered,
The sad loss of all that to manhood is dear—
The time when none kindness or sympathy offered.
But the trial has past,
Though long it did last,
And their chains and their bondage
Far from them they've cast;
And the Temperance Banner
In triumph doth wave
O'er the heads of the rescued
Free sons of the brave.

Oh, where is the promise that Alcohol gave,
To place his poor victim 'bove sorrow and anguish;
Of all his fond hopes, not one now remains,
And his many fair dreams, all, all are now banished.
His promise was air,
And false as 'twas fair,
And again them to offer
He never will dare,
While the Temperance Banner
In triumph doth wave,
O'er the heads of the rescued,
Free sons of the brave.

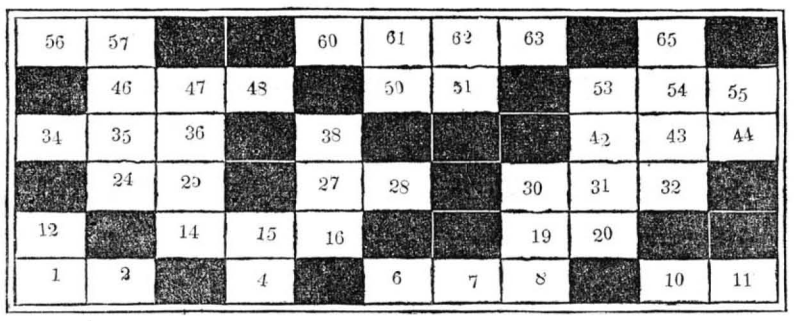
Thus be it ever, while the reform'd shall stand,
Between his dread foe, and his hearts desolation,
Thus happy and free may the now rescued band
Bless the power that brought them again to their station.
And conquer we must,
For our cause is most just:
And this be our motto:
'In God let us trust;
And the Temperance Banner
Forever will wave,
O'er the heads of the free,
And the homes of the brave,

Directions to a Painter.

"Represent me in my portrait," said a gentleman to his painter, "with a book in my hand, and reading aloud. Paint my servant also, in a corner, where he cannot be seen, but in such a manner that he may hear me when I call him"

The largest pyramid of Egypt is a square of 726 feet; its height is 461 feet, higher by 25 feet than St. Peter's at Rome. It contains about six millions of tons of stone.

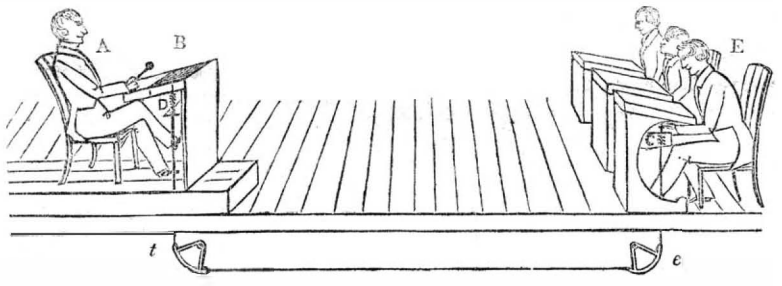
VOTING IN LEGISLATIVE ASSEMBLIES.



It is shown by the Journal of Congress, that the yeas and nays were called during the last session, no less than five hundred times. The time occupied by these calls and process of counting, is nearly forty minutes each on an average, and is computed to have occupied in the aggregate one hundred days of the session. This amount of time, at eight dollars per day for each of two hundred and twenty-four members, has cost the nation about $180,000.—There was also much time occupied in counting the ordinary votes, when the yeas and nays were not called for, which being added to the one hundred days, would swell the expense to at least two hundred thousand dollars. In all State Legislatures, especially in the House of Representatives of Massachusetts, which sometimes numbers four or five hundred members, there is a considerable portion of the time of the session taken up in voting, counting, &c. But it is a fact very easy of demonstration, that at least seven-eights of this times might be saved by means of a simple mechanical apparatus, which would not in the first instance cost one-fourth part as much as the value of the time thereby saved in a single session. This apparatus we shall proceed to describe.

The Speaker's desk is furnished with a scale about twenty inches long and ten or twelve inches wide, and in which are arranged the requisite number of moveable keys, each of which bears a different numerical figure,—and they are so constructed as to be ordinarily depressed below the surface so as to disappear except when a part or all of them are brought up to the surface, as represented at the head of this article, and by a method which we shall describe in connection with the following

ILLUSTRATION.



EXPLANATION.—In this engraving is represented the President or Speaker A before whom is a voting scale B, and at a distance several member E; through it will be readily understood that a similar connection with the voting scale may be extended to any number of members arranged in any direction or distance. From each moveable key of the scale, a small metallic rod extends perpendicularly a few inches, and is connected to a spring D, in which it is enclosed, and which tends to elevate the key and hold it up to the surface of the scale. From this rod a wire descends through the floor of the hall to the angle of a quadrant *e*, from the opposite corner of which another wire extends horizontally to another quadrant, *t*, under the desk of the member, and which is also connected by another vertical wire, to another vertical rod *c*, which is supported by another spiral spring, stronger than that of the key rod: so that the latter is ordinarily held in a depressed position. To the head of this second rod, is attached a ball or cap, which being under the board of the member's desk, is excluded from view; but is under the control of the member, who can at any time, and unperceived, depress the cap and thus elevate the corresponding key of the voting scale. Each key of the scale is connected to a rod and cap attached to the desks of different members, and the numbers on the keys correspond with the numbers of the seats, and when the yeas and nays are required to be recorded, the Speaker has only to lay a sheet of black transfer paper upon the scale: and over this a sheet of white paper, and pass over the latter a light elastic roller covered with buff leather, and the number of each voter will be instantly and distinctly transferred to the white paper. In ordinary voting when the names of the members voting are not required to be known, the Speaker has only to count the number of votes which appear in the scale, without taking an impression. If the situation of the assembly room or hall, is such as to render it inconvenient to arrange the connections under the floor, the wires may be elevated to the top of the room; and if very small wires are used, they will hardly be noticed, and will not injure the appearance of the room. The entire expense of this apparatus will not exceed five dollars to each member or desk, and will in some instances effect a saving of time in one session equal to 100 times the cost of the apparatus. Nevertheless, it is not to be expected that the plan will be adopted by Legislatures, for the very reason that it is calculated to shorten the sessions, and consequently, the pay of the members.

Election in New Mexico.

Gen. Kearney, by order of this Government, has ordered an election of a delegate to Congress from the Territory of New Mexico, to be held on the 25th instant, and also members of a Territorial Legislature, to assemble in Santa Fe, on the second Monday in December, the Senate to consist of 13 and the House 32 members.

A Strange Animal.

An uncouth animal has been exhibited as the "Wild man of the Prairies," at Egyptian Hall, London. But the strange animal, is said to have been discovered to be no other Harvey Leach, who figured successfully in this country as "Hervio Nano," some years since. This may be the fact, though we have recently seen the name of Harvey Leach mentioned as being then at Philadelphia.

A LIST OF PATENTS

Issued from the 5th of September to the 20th of September, 1846, inclusive.

To John F. Rodgers of Troy, N. Y., for improvement in Rail Road Trucks. Patented 5th September, 1846.

To John and Cyrus Krauser, of Reading, Pa. for improvement in Combined Ploughs. Patented 5th Sept. 1846.

To George Catchpole, of Geneva, N. Y. for improvement in Straw Cutters. Patented 5th Sept., 1846.

To Joseph W. Adams, of Boston, Mass. for improvement in Bedstead fastenings (assigned to Simeon H. Lewis and John C. Clapp.) Patented 10th Sept., 1846.

To William H. Allen of Willsburg, Va. and James Slocom, of Brownsville, Pa.. for improvement in Cooking Stoves. Patented 10th Sept., 1846.

To Elias Howe, Jr. of Cambridge, Mass., for improvement in Sewing Machines. Patented 10th Sept., 1846.

To Samuel Thrailkill, of Lafayette, Ia., for improvement in Ditching Machines. Patented 10th Sept., 1846.

To Augustus Haman, of Washington, D. C. for improvement in Spark Arresters. Patented 10 Sept., 1846.

To Ezekiel Cutter and Stephen Blanchard, of Cincinnati, O., for improvement in Artificial Mill Stones. Patented 10th September 1846.

To Augustus C. Alten, of Houston, Texas, for improvement in Curing Meat, &c. Patented 12th Sept., 1846.

To Jesse Fitzgerald, of New York city, for improvement in Artificial Stones for grinding. Patented 3d Sept., 1846.

To William H. Marston, of New York city, for improvement in Printing Presses. Patented 12th Sept., 1846.

To Joshua Gibbs, of Fewark, O., for improvement in Platform Balances. Patented 12th Sept., 1846.

To Edward Bradfield, of Rochester, New York, for improvement in Bolting Flour. Patented 15th Sept. 1846;

To Samuel S. Walley, of Charlestown, Pa., for improvements in Coffer Dams. Patented 15th Sept, 1846.

To James R. Hobbs, of Huntsville, Ala., for improvement in Blacktmith's forges. Patented 15th Sept. 1846.

To Thaddeus Fairbanks, of St. Johnsbury, Vt., for improvement in Steelyards. Patentod 15th Sept., 1846.

To Isaac Edwards, of Paoli, Ia, for improvement in Cultivators. Patented 19th Sept. 1846.

To William Whitcomb, of Grafton, Vt.. for improvement in Bee Hives Patented 19th Sept 1846.

To Oliver Allen, of Norwich, Ct., for improvement in Whaling Lances. Patented 19th Sept, 1846.

To David Barnum, of New York, improvement in Double Cylinder Steam Engines, Patented 19th Sept. 1846.

To Isaac Mayfield, of Elkton, Ky., for improvement in Straw Cutters. Patented 19th Sept. 1846.

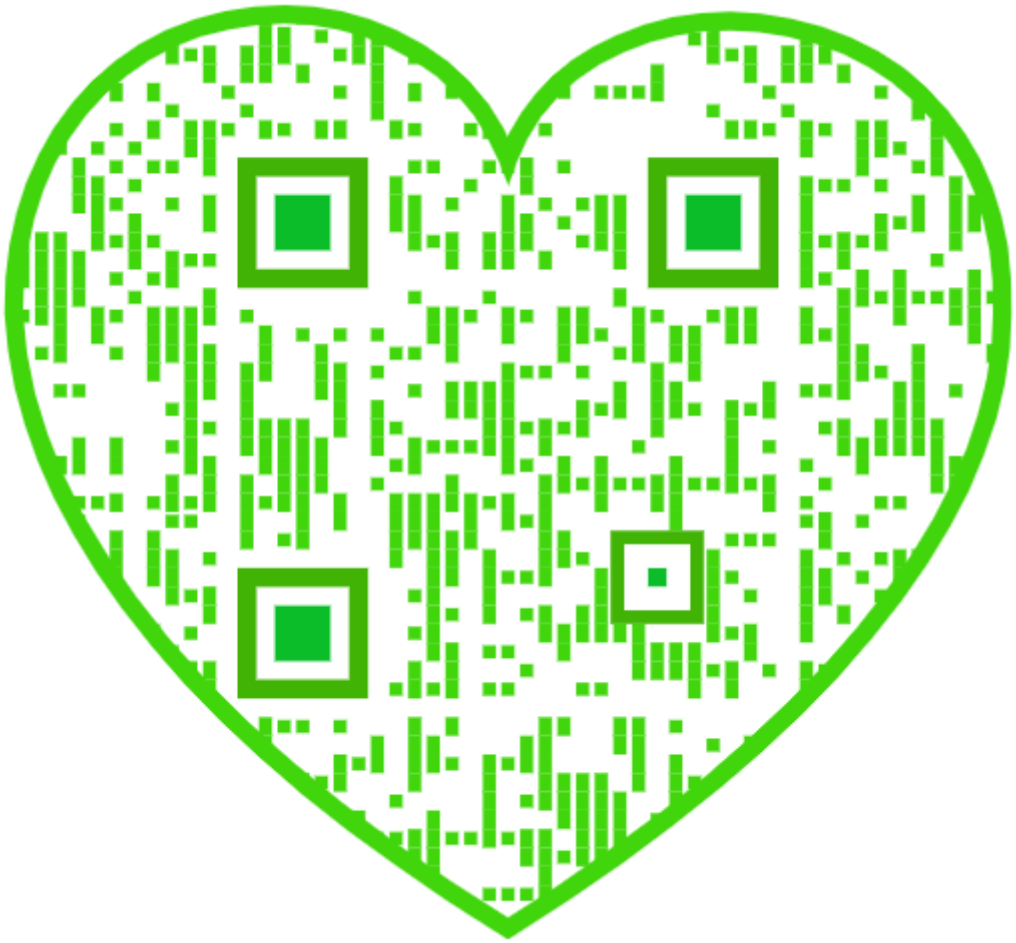
To Gardner Barton, Jr., and Lysander Button, of Waterford, New York, for improvement in Fire Engines. Patented 19th Sept. 1846.

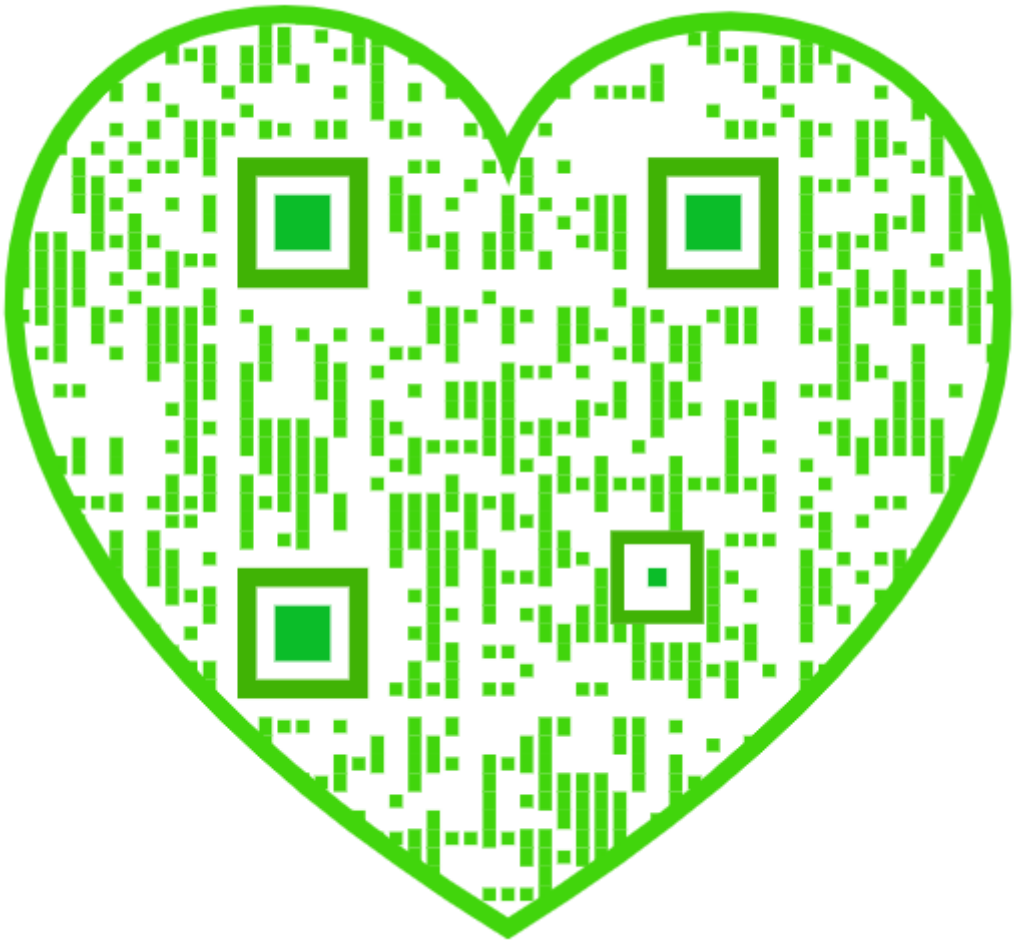
To Geo. R. Moore, of Philadelphia, Pa., for improvement in Machinery for double seaming. Patented 19th Sept. 1846.

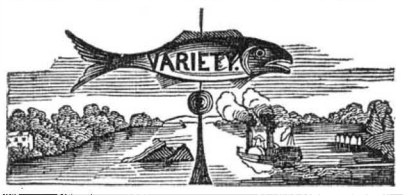
To Henry Mellish, of Drewsville, N. H., for improvement in Self Setting Tail Blocks. Patented 19th Sept. 1846.

To Thomas Laighton, of Cambridge, Mass., for improvement in Glass Furnaces. (Assigned to the New England Glass Company, Patented 19th Sept. 1846.

© 1846 SCIENTIFIC AMERICAN, INC







Kind Words.

Oh! what a spell of mighty power,
There's lurking in kind words,
To gild with light the tempest hour,
And shrill the bos om's chords.

The wounded heart that time hath chilled,
Whose young glad dreams are o'er,
Can be again with rapture filled,
As in the days of yore.

The tear-dimm'd eye may sweetly smile—
The cheek regain its bloom,
And joyance linger there awhile,
Like sunlight o'er a tomb;

And half forgotten dreams may come,
Wak'd by a gentle breath,
And ties of kindred and of home,
Start from their sleep of death;

The long—long years of happiness,
That vanish'd from our youth,
The woven links, once went to bless
With trustfulness and truth;

The severed chain that used to bind,
With young affection deep,
The human heart, where hopes enshrin'd
Their holiest love-watch keep;

All that have passed away, and left
Their withering records here,
To reach the sickened soul bereft
How transient joys appear;

All from the fount of memory rush,
Like flowrets newly strown,
And the glad bosom's sudden gush,
Attests the gentle tone.

A little thing can sweetly ring
The heart's harp-broken chords;
Whoe'er has power to bid them sing,
Oh! spare not thou kind words.

Come Away.

O, come, come away! for time's career is closing;
Let worldly care henceforth forbear;
O, come, come away!
Come, come! our holy joys renew,
Where love and heavenly friendship grew:
The spirit welcomes you!
O, come, come away!

Awake! ye awake! no time now for reposing;
"The Lord is near!" breaks on the ear,
O, come, come away!
Come, come where Jesus' love will be,
Who says, "I meet with two or three:"
Sweet promise made to thee!
O, come, come away!

Come where sacred song the pilgrim's heart is cheering;
Come learn you there the power of prayer,
O, come, come away!
In sweetest notes of sympathy
We praise and pray in harmony:
Love makes our unity;
O, come, come away!

Night soon will be o'er! and endless day appearing;
Away from home no more roam:
O, come, come away!
And when the trump of God shall sound,
The saints no more by Death are bound;
He owns our Jesus crowned;
O, come, come away!

O, come, come away, my Savior, in thy glory!
"Thy kingdom come, thy will be done,"
O, come, come away!
O, come, my Lord, thy right maintain,
And take thy throne and on it reign;
Then earth shall bloom again!
O, come, come away!

A Healthy Town.

In the town of Gill, Franklin Co., Mass., there have been but three deaths within a year past, and each of these subjects was upwards of eighty years old.

Another Mammoth Cave.

We learn from the Columbia, (Tenn.) Democrat that a gentleman of that town has discovered a "mammoth cave" in the county of Maury. The gentleman, incompany with another, entered the cave, which they supposed was a small one, in search of fugitive slaves, and after proceeding a considerable distance they endeavored, ineffectually, to retrace their steps. In this dilemma, (says the account,) to remain inactive was sure destruction, for no one knew of their design or whereabout, and the only determination was to proceed, if haply they might find some outlet. While wandering on this most singular adventure, sometimes stumbling over rocks, and at other times on their hands and knees, crawling through narrow entrances into large and spacious rooms, beautifully decorated with stalactities of glittering appearances hanging in various forms and shapes, with walls of rock on either side, their steps and voices echoing through the grottoes and deep recesses, passing streams of thirty and forty yards in width and some three or four in depth, they at length became greatly encouraged, from the circumstance of their lights burning more freely, and renewing their efforts they soon discovered an outlet, and once more found themselves on terra firma, and above ground.

They entered the cave between 9 and 10 o'clock, in the evening, and came out about 3 o'clock in the morning; having been six hours in this subterranean region, travelling with all the speed their strength would admit of, until they found an egress about six miles from the place of entrance.

Power of Music.

An Albany paper relates that a party from that city not long since, went on a pic-nic excursion down the Greenbush bank and held their feast in a well shaded piece of woods near a large meadow where a horse and several cows were grazing. After the party had partaken of a sumptuous repast, they commenced singing a very beautiful air. The horse, it was noticed, approached near the woods, and stood listening very attentively to the fair songsters. The cows, in turn, approached the spot, and appeared to be intent on hearing the "fairy-like music." A mischievous boy with the party, who was playing about the field, drove the animals away, but it was noticed that when the party struck up another tune, the horse and two of the cows approached the spot again, and listened apparently with more earnestness than before, and when the party started for their homes they were followed some distance by the beasts. These animals had evidently ears for music

Curing Measles.

A good lady who had two children sick with the measles, wrote to a friend for the best remedy: The friend had just received a note from another lady, inquiring the way to make pickles. In the confusion,, the lady who inquired about the pickles received the remedy for the measles, and the anxious mother of the sick children read as follows: "Scald them three or four times in very hot vinegar, and sprinkle them well with salt, and in a few days they will be cured.

A Revolution in Cotton Planting.

The most important discovery of the day, is the adaptation of the uplands of the old cotton growing State, to the cultivation of Mastodon cotton, a new species of the plant which commands about double the price of the unprofitable short staple cotton hitherto produced on the highlands of the cotton region.

Mammoth Pumpkin.

Mr. Wm. Guernsey, of this village, exhibited to us last week, a pumpkin which grew in his garden, of the acorn shape, which measured seven feet, five inches one way, five feet six inches the other, and weighed *one hundred and tweaty-eight pounds.—Stamford Advocate.*

Carolina Sugar.

It is ascertained by experiment, that sugar cane can be raised in North Carolina—and some of the farmers of Sampson county are preparing to go into the regular business of sugar making. Indeed it is expected that a considerable quantity will be made by them the present season.

The Grand Æolichord.

Since our former notice of this incomparable instrument, we have had the pleasure of examining it, and hearing the melody of its tones. There has been within two or three years, frequent mention made of improvements in, or attachments to the piano; and as some may suppose this Æolichord to be one of those spoken of heretofore, we shall briefly notice some of them in order. First we had Coleman's Æolian Attachment, which became extremely popular, and is highly prized by good performers. The next which presented claims to public attention, was Walker's Harmonic Attachment, the effect of which is sweet but not powerful. Some other miner improvements, have been introduced, but Draper's Grand Æolichord which is now brought befere the public, appears to distance all others, and the demand for it already exceeds the means of supplying them. This attachment consists of an additional set of strings which are placed over the principal strings, and tuned an octave below them, and have the effect to give distinct additional sounds, and produce a melody similar to that of two instruments playing at the same time. One of these Æolichord, may be seen at No. 383 Broadway, where Mr. Draper is happy to receive the visits of those who take an interest in the advance of musical improvements.

Telegraph South.

We understand, says the Philadelphia Gazette, that the Magnetic Telegraph Company have agreed to extend another wire from this city to Baltimore, and also another range of poles for two wires from this city to New York, the work to be commenced immediately and to be paid for from the funds of the company. This last conclusion denotes the successful operation of the wonderful work, and is an evidence of the growing utility and general appreciation of the lines.

Improvement in Steam Pistons.

By James Richards, 3rd Oct., 1846.—Claim: the use and application to pistons of the three or more inclined elastic rings breaking joints and fitted to each other, of cast iron or any suitable material on the principle, and combined together, and with a piston bulk-head and follower, or any substitutes for them, and working together.

Artificial Stone Pavements.

A correspondent of the New York Sun recommends the application of the artificial stone cement to the streets of this city, as a pavement. It would indeed render the streets agreeable to ride over, but one grand difficulty is the necessity of frequently breaking up the pavements to repair the various gas and water pipes.

Rising by Gradation.

John Young, the Governor elect of this State was born of poor parents; he qualified himself as a teacher in a common country school, was elected a member of the State Legislature, then a member of Congress, and is now elected to the office of Governor of the principal State in the Union.

Enterprise at Pittsburgh.

In the course of *eight* months, not less than twenty-five hundred brick houses have been erected in that city, including many noble and costly factories, an evidence of prosperity never before equalled in any part of the world.

New England Vessels.

The activity in freight in New York, has made it necessary to send to Boston for vessels to make up the deficiency. Several have been bought, and others chartered, in that port by the New York merchants.—*Boston paper.*

In Less than no Time.

The Rochester Advertiser of the 18th ult., says: "Yesterday at a quarter *before* three, we received word from Boston, via. New-York, that there was no steamer in sight at *three* o'clock.

The Great Cedar.

In Lombardy there is a celebrated cedar tree, eleven Milanese cubits in circumference, the roots of which are said to extend under a great part of the town. In the sixteenth century the tree was about the same size, and is supposed to be nearly two thousand years old.

Dallas's Night Cap.

The Hot Blast of the Valley Furnace has been roofed in, and the whole works put in a state of suspension. The roof is surmounted with a barrel which is labelled "Dallas's Night Cap —*Miners' Journal.*

Vermont Plowman.

Is the title of a bright little paper recently commenced at Middlebury, Vt., by D. S. Witherby. We like particularly the title of the paper, and expect it will be well sustained.

The Election.

We need not inform our readers that the Whig ticket has prevailed in this state, because every body has heard of it: so we let that pass.

Wood Fuel.

One cord of dry wood split fine will do more service in heating kettles in a furnace than three cords of coarse wood.

Gen. Worth, the hero of Monterey, was a merchant's clerk, in Hudson, on the North river, 35 years ago. He entered the army as a private, according to a letter before us, at the opening of the war of 1812—distinguished himself at Lundy's Lane, where he was wounded, and at the suggestion of Gen. Scott, promoted. He won honor in the Florida war, and has crowned himself with glory at Monterey.

When Abernethy was consulted by a young lady, he said. "How can you expect to be well when you squeeze your waist to the size of a quart pot! Go! go home! leave off your stays; burn them, and here take this shilling, buy a skipping rope at the first toy shop you come to, and use it every day—you will then be able to eatlike a rational being.

One of the city papers, speaking of the extravagance in dress which prevails in this city, says: "We know ladies who wear shawls worth one thousand dollars, and pocket handkerchiefs worth two hundred and fifty dollars."

An itinerant preacher, who rambled in his sermons, when requested to stick to his text, replied that "scattering shot would hit the most birds."

"The present scarcity of money," said a deliberate wiseacre to his wife, "is owing to—." "You are right, my honey—it is because there is so much owing to, and so litle paying to."

A lad of 79 married a little girl of 72, in Worcester, Mass.' on the 16th. Where were their mothers and fathers, that such carryings on were allowed.

Two hundred and forty-eight rails, or forty-two tons of railroad iron, were manufactured in one day last week at the foundry on the Mill Dam, Boston.

The Queen of Spain has, by a decree, conferred the title of King upon her husband Don Francisco d'Assis. He is to take no part in the affairs of Government.

Two new locomotives,—the *Massachusetts* and *Connecticut*,—of 18 tons weight each, have been received at Bridgeport to run on the Housatonic Railroad.

The preparation of the *explosive cotton* is said to consist in simply dipping common cotton in nitric acid, and immediately washing it in water and drying.

Jersey City is to be the terminus of the Cunard line of steam-ships to be established between New York (?) and Liverpool. The steamers are to run every other week.

Mr. J. B. Gough lectured in Boston on Sunday evening to a crowded house (Tremont Temple) nowithstanding it was his 150th lecture in that city.

At a military muster in Missouri, a respectable farmer was killed by blows on the side of the head, from the fist of another person.

Punch says that the most effectual method for resuscitating a drowned Yankee, is to search his pockets.

The mammoth cannon at South Boston, has been discharged, experimentally, 93 times at various elevations and different charges.

© 1846 SCIENTIFIC AMERICAN, INC

NEW INVENTIONS.

Rotary Steam Engine.

There is perhaps no desideratum in mechanical movements—the perpetual motion excepted,—which has been so diligently sought, or on which the attention of so many inventors have been fixed, as that of a permanent rotary steam engine: a revolving wheel, on which a current of steam might expend its full force, without waste, by leakage, or loss by friction, and which would continue a length of time in operation without injuring by wear or otherwise. We are not prepared to say that this has yet been fully accomplished; but we have recently seen and examined a rotary engine, invented and patented by Dr. Schnibley, editor of the Hagertown (Md.) Pledge, and have no hesitation in saying that it will work more power in proportion to the quantity of steam or fuel employed, than any cylindric reciprocating engine in operation: and that the construction of the engine is simple, and apparently permanent. We shall not attempt a particular description till we procure an engraving: but the engine will be exhibited in full operation shortly, of the time and place of which, due notice will be given. We may have something more to say on the subject in our next.

New Planing Machine.

Mr. Job Shelden of New-Haven, Ct., has invented a machine for planing boards, in which is combined more originality of mechanical movement, with judicious proportion and application, than we have seen in any new invention within the year past. In this machine, the inventor has boldly struck out on entirely new principles of operation, and there appears nothing about the machine which bears any resemblance to those of Woodworth, Daniels, or any other in use. It carries a series of planing cutters which work with a reciprocating motion, cutting transversely, but with oblique edges, in each opposite direction. Measures are already in progress for securing a patent, and the invention will, in some measure, relieve this branch of industry from the aristocratic monopoly by which it has recently been oppressed.

New Printing Press.

A hand printing press has been invented in England, by which one man can work off 1200 impressions per hour. The size of the press is represented to be about twice as large as the common pull presses, but we have seen no description of its construction. We are satisfied that there is yet an open field for improvements in printing presses, and should not be surprised to see one introduced, by which the pressman can operate the machinery by double treadles while his hands are employed in feeding the machine. It must be evident to every close observer, that more than half the power applied to the Napier Press, is used up in friction. Let this be avoided, and the press work will be light.

Improvement in Straw Cutters.

The only claim specified by the inventor, is the "combination of brushes with the guage-boards, vibrating frames and cutting blade." The introduction of brushes—rotary brushes of course,—constitutes simply an improvement on machines which have been in use before. Application for a patent was entered by J. T. Wade, Oct 3d, 1846.

Improved mode of Voting.

We would commend the prominent article on our first page, to the consideration of those who have had their patience tried by the protracted sessions of Legislatures, without the accomplishment of business enough to pay for warming and repairing the hall in which they were assembled.

Pennington's Ærial.

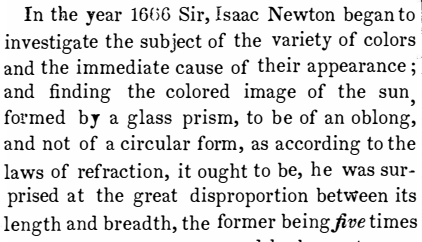
Mr. Pennington, the sanguine inventor of a plan for Ærial navigation, has been recently exhibiting his machine at Wheeliag, Va. The 'Harmonions' performing at that place, generously proffered him a benefit in order to assist him in his endeavors to demonstrate the practicability of his plan. We are glad he is calling up attention to the subject.

The Colors of Light.

In the year 1666 Sir, Isaac Newton began to investigate the subject of the variety of colors and the immediate cause of their appearance; and finding the colored image of the sun, formed by a glass prism, to be of an oblong, and not of a circular form, as according to the laws of refraction, it ought to be, he was surprised at the great disproportion between its length and breadth, the former being *five* times the length of the latter; and he began to conjecture that light is not *homogeneal*, but that it consists of rays, some of which are much more refrangible than others. Prior to this period, philosophers supposed that *all* light, in passing out of one medium into another of different density, was *equally* refracted, in the same or like circumstances; but that there are *different species* of light, and that each species is disposed both to suffer a different degree of refrangibility in passing out of one medium into another, and to excite in us the idea of a *different color* from the rest; and that bodies appear of that color which arises from the peculiar rays they are disposed to reflect. It is now, therefore, universally acknowledged that the light of the sun, which to us seems perfectly homogeneal and white, is composed of no fewer than *seven* different colors, namely, Red, Orange, Yellow, Green, Blue, Indigo and Violet. A body which appears of a red color has the property of reflecting the red rays more powerfully than any of the others: a body of a green color reflects the green ray more copiously than rays of any other color, and so of the orange, yellow, blue, purple and violet. A body which is of a *black* color, instead of reflecting, *absorbs* all, or the greater part of the rays that fall upon it; and, on the contrary, a body that appears *white* reflects the greater part of the rays indiscriminately, without separating the one from the other.

Before proceeding to describe the experiments by which the above results were obtained, it may be proper to give some idea of the form and effects of the *Prism* by which such experiments are made. This instrument is triangular and straight, and generally about three or four inches long. It is commonly made of white glass, as free as possible from veins and bubbles, and other similar defects, and is solid throughout. Its lateral faces, or sides, should be perfectly plane, and of fine polish. The angle formed by the two faces, one receiving the ray of light that is refracted in the instrument, and the other affording it an issue on its returning into the air, is called the *refracting angle* of the prism, as A. C. B. The manner in which Newton performed

FIGURE 1.



his experiments, and established the discovery to which we have alluded, is as follows:

In the window-shutter, E G of a dark room, a hole, F, was made, of about one-third of an inch diameter, and behind it was placed a glass prism A C B, so that the beam of light S F, proceeding directly from the sun, was made to pass through the prism. Before the interposition of the prism, the beam proceeded in a straight line towards T, where it formed a round white spot; but, being now bent out of its course by the prism, it formed an oblong image upon the white pasteboard, or screen, L M, containing the seven colors, marked in the figure, the *red* being the *least*, and the *violet* the *most* refracted from the original direction of the solar beam, S T. This oblong image is called the *prismatic spectrum*. If the refracting angle of the prism, A C B, be 64 degrees, and the distance of the paste-board from the prism about 18 feet, the length of the image will be about ten inches, and the breadth 2 inches. The side of the spectrum are right lines distinctly bounded, and the ends are semi-circular. From the circumference, it is evident that it is still the image of the sun, but elongated by the refractive power of the prism.

By making a hole in the screen, L M, opposite any one of the colors of the spectrum, so as to allow that color alone to pass—and by letting the color thus separated fall upon a second prism—Newton found that the light of each of the colors was alike refrangible, because the second prism could not separate them into an oblong image, or into any other color. Hence he called all the seven colors *simple* or homogeneous, in opposition to *white* light, which he called *compound*, or heterogenous. With the prism which this philosopher used, he found the lengths of the colors and spaces of the spectrum to be as follows:—Red, 45: Orange, 27; Yellow, 40; Green, 60; Blue, 60; Indigo, 48; Violet, 80; or 360 in all. But these spaces vary a little with prisms formed of different substances, and, as they are not separated by distinct limits, it is difficult to obtain anything like an accurate measure of their relative extents. Newton examined the ratio between the sines of incidence and refraction of these decompounded rays, and found that each of the seven primary colors making rays had certain limits within which they were confined. Thus, let the sine of incidence in glass be divided into 50 equal parts, the sine of refraction into air of the *least* refrangible, and the *most* refrangible rays will contain respectively 77 and 78 such parts.—The sines of refraction of all the degrees of *red* will have the intermediate degrees of magnitude, from 77 to 77 one-eighth; *Orange*, from 77 one-eighth to 77 one-fifth; *Yellow*, from 77 one-fifth to 77 one-third; *Green*, from 77 one-third to 77 one-half; *Blue*, from 77 one half to 77 two-thirds; *Indigo*, from 77 two thirds to 77 seven-ninths; and *Violet*, from 77 seven-ninths to 78.

From what has been now stated, it is evident that, in proportion as any portion of an optic glass bears a resemblance to the form of prism, the component rays that pass through it must be necessarily separated, and will consequently paint or tinge the object with colors. The edges of every convex lens approach to this form, and it is on this account that the extremeties of objects, when viewed through them, are found to be tinged with the prismatic colors.

From what has been stated in reference to the solar spectrum, it will evidently appear that white light is nothing else than a compound of all the prismatic colors; and this may be still further illustrated by showing that seven primary colors, when again put together, recompose white light. This may be rudely proved, for the purpose of illustration, by mixing together seven different powders, having the colors and proportion of the spectrum; but the best mode, on the whole, is the following: Let two circles be drawn on a smooth round board, covered with white paper, as in

FIGURE 2.

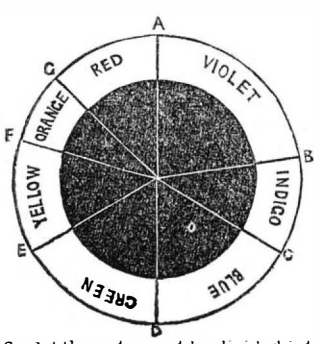


figure 2; let the outermost be divided into 360 equal parts; then draw seven right lines, as A, B, C, &c., from the centre to the outermost circle, making the lines A and B include 80 degrees of that circle. The lines B and C, 40 degrees; C and D 60; D and E, 60; E and F, 48; F and G, 27; G and A, 45. Then between these two circles paint space A G red, inclining to orange near G; G F orange, inclining to yellow near F; F R yellow, inclining to green near E; E D green, inclining to blue near D; D C blue, inclining to indigo near C; C B indigo, inclining to violet near B; and B A violet, inclining to a soft red near A. This done, paint all that part of the board black which lies within the innner circle;—and, putting an axis through the centre of the board, let it be turned swiftly round that axis, so that the rays proceeding from the above colors may be all blended and mixed together in coming to the eye. Then the whole colored part will appear like a white ring a little grayish—not perfectly white, because no art can prepare or lay on perfect colors, in all their delicate shades, as found in the real spectrum.

That all the colors of light, when blended together in their proper proportions, produce a pure *white*, is rendered certain by the following experiment: Take a large convex glass and place it in the room of the paper or screen on which the solar spectrum was depicted;—the glass will unite all the rays which come from the prism, if a paper is placed to receive them, and you will see a circular spot of pure lively white. The rays will cross each other in the focus of the glass, and if the paper be removed a little farther from that point, you will see the prismatic colors again displayed, but in an inverted order, owning to the crossing of the rays.

Mammoth Engines.

The Great Western Company continue to turn out new engines even of more stupenduous build than any before. A splendid one, the *Elk*, has just been slipped off the anvil, to be specially employed in the express train service. The Elk was designed by Mr. Brunel, under the superintendence of Mr. Gooch; her dimensions are—driving wheels 7 feet. diameter, stroke 18 in., cylinder 16 in., boiler 14 ft.; weight of engine, without water, 25 tons: weight of tender without coke or water, 9 tons. Though the machine cannot be expected to be as yet in proper working order, she was attached to an express train with six carriages, and performed a distance of 77 miles (from Swindon to Paddington) in 1h. 20 m.—The down journey was not so rapid, having been 1h. and 31 m. performing it. Besides the Elk, the following large locomotives are in working—the *Great Western*, diameter of driving wheels 8 ft., cylinder 18 in., stroke 24 in., boiler 16 feet.; weight of engine, without water, 36 tons; weight of tender, without fuel or water, 10 tons—making a total of 46 tons; this engine was built for passenger trains, upon the same plan as the Elk. The *Prince* and the *Queen* engines are of the same dimensions, and are also for passengers trains. The *Bellerophon* and the *Premier* are luggage engines, having 6 wheels of 5 feet in diameter connected; the dimensions in other respects, and their respective weights, being similar to the Great Western passenger engine. These luggage engines are decidedly the most powerful, and surpass in power and speed the *Hercules*, which impelled a train weighing 106 tons, in the experimental trip with the Gague Commissioners.—*National Magazine.*

Taylor's Marine Camels.

Another experiment was tried with these camels in our waters yesterday, on which occasion a vessel of the largest class was taken over a bar which she could not possibly have passed in any other manner. The more we examine the merits of this new invention, the more are we impressed with the advantages which will be derived from its general introduction into our Navy. The inventor has followed the sea from boyhood, and the dangers to which he has been exposed, for the want of an instrument of this kind, together with the existing necessities in the particular of our naval force in the Mexican waters, first gave him the idea of an India Rubber Camel, and it is gratifying to know that the best judges have pronounced it an invaluable invention. The officers of the American Institute, were so much pleased with it, that they have taken the pains to publish a full report, wherein they recommend it to the public in the strongest language. Not only can these camels be used to lighten vessels over sand bars, and to get off those that may have been stranded, but by being inflated and placed in the hold of a ship, they will keep the heaviest craft from sinking and thereby be effecutual in preserving life as well as property. These camels will, undoubtedly, be most gladly welcomed by the sailors and shipping merchants of the great lakes, where sand bars are so abundant and dangerous. We are not at all acquainted with the past history of Captain Taylor, but it seems to us that he must hereafter be considered the author of an eminently remarkable invention.—*N. Y. Eve. Post.*

The Bunker Hill Aurora says that Mr. S. Tewksbury has a flourishing orchard of figs, at Chelsea, Mass.

© 1846 SCIENTIFIC AMERICAN, INC

Manufacture of Iron.

A series of Practical Experiments highly interesting to Iron Manufacturers.

BY M. AUG. MALBERG.

[From the Bulletin du Musee del l' Industrie.]

(*Continued from No.* 7.)

In bars of rolled iron crystaline portions are frequently met with, which render those parts where they occur brittle. Amongst a great number of bars manufactured from the same pig iron, some will be found much inferior to others as regards the tenacity or veiny character of their texture.

In order to ascertain from what cause rolled iron acquires a crystaline texture in the process of manufacture, I undertook a series of experiments which I will now explain.

It is a well known fact, that when the pig iron does not remain a sufficient length of time in the puddling furnace, or when that operation is not properly performed, so that all its particles may be sufficiently separated and brought into suitable contact with the flame passing over it, impure puddled iron will be obtained, containing portions of iron not completely refined, and also extraneous matter, such as silica, arsenic, sulphur, phosphorous, &c.—This may be easily ascertained by the appearance of the fracture, which, in that case, will be grey and of an unequal character, of a short fibrous or coarse crystaline quality. It is also well known that if, after puddling and blooming, too low a welding heat is given under the hammer, a mechanical mixture of carbon and dross will remain in the iron (especially, if on afterwards passing it between the rollers, the pressure is not sufficiently strong,) and in that case the iron soon becomes brittle. It is, however, possible that, with too great a heat, the iron will retain its original granular texture, if it is not afterwards sufficiently worked, as will be seen from the following experiments:

Choice was made of two puddling furnaces, both of which were charged with a similar quantity of the same pig iron, some days after putting them to work, and not till after they had acquired an equal temperature and worked regularly. This pig iron was worked in the same manner in both furnaces, and equal care was taken in performing the process of puddling. In one of these furnaces the blooms were removed immediately after refining, wrought under the hammer, and beaten flat to the size of about 6 inches in breadth, and 3-4 of an inch in thickness, and passed in this state through rollers having seven grooves. I then remarked, that under the hammer and between the rollers a large quantity of dross was separated, and the welding was effected with great facility.

In the other furnace the blooms were left 20 minutes longer, and then submitted to the hammer and rollers as before. By this mode of treatment less dross appeared in the blooms; but it appeared that the hammering and rolling were not performed with the same facility on these blooms of a dry nature; that particles of iron were detached even under the hammer; and that the bars, on coming from the rollers, were more flaky, and more full of flaws at the edges.

On examining the fractures made in these bars, the quality of the iron appeared in both cases identical. This fracture was of fibrous quality, of a silver grey color, with here and there some projecting crystals; from this it was not thought necessary, during the other experiments, to classify the different sorts, and they were used indiscriminately.

I think proper to make an observation here upon the crystals, which were somewhat abundant in the iron after the first operation of the rollers:—When these crystals are very fine and of clear color, their quality is good; they will disappear on being passed consecutively through the rollers; and the iron will be of very fine quality when the rolling operation is finished. This fact is well known in iron-works; and care is taken to put these crystaline bars on one side, as they are not required to be submitted to the test usually made of the work of the puddler. I have convinced myself of the truth of this by forging a fine granular bar, which had paassed through the first operation, and which, under the hammer, acquired a fine fibrous texture.

By this means the fact is therefore confirmed, that suffering the bloom to remain for any length of time in the puddling furnace has not an injurious influence upon the quality of the iron produced. It is, however, as well to remark, that in that case there will be greater waste of iron owing to the friability or dryness of the metal under the hammer. But it is also observed, that by prolonging the application of heat in the puddling furnace, iron of good quality may be manufactured from pig iron of inferior quality. From this fact it has been proposed to apply heat for a longer time with an open register; a plan by which, it is true, better iron may be produced from an inferior material, but which has, however, been for the most part abandoned, as from the waste, consumption of fuel, and loss of time, the iron produced is more expensive than if pigs of the best quality had been employed.

In order to determine the degree in which, in the successive operations of heating in the welding furnace, hammering into rectangular bars, and rolling, a change takes place in the iron, the following experiments were made:

After examing the surfaces of fracture of all the rolled bars, and sorting them, they were made up into bundles of eight bars deep, and about five feet long, introduced into a welding furnace, and forged with a hammer of 2000 lbs. weight into rectangular bars, which were again introdued into the furnace, and afterwards rolled into bars 3-4 of an inch in thickness.

The pile, No. 1, was suitably heated and forged.
——— No. 2, ditto.
——— No. 3, was strongly heated and forged.
——— No. 4, less heated and forged.

Previously to passing them through the rollers they were operated upon as follows:—

No. 1, was again heated on a high temperature.

No 2, was heated to the ordinary welding heat.

No. 3, was heated at a higher temperature than No. 2, until the upper part was burned and half converted into waste.

No. 4, was kept at the ordinary welding heat.

On examining a fracture made in the bars after rolling, the following results were observed:

No. 1, which was kept at a good welding heat, both before hammering and rolling, had a clear and even fracture; some very small crystals were perceptible in several places, but they were for the most part oblong and not angular.

No. 2, also kept at a good welding heat, both before hammering and rolling, had a clear and even fracture, but some crystals were already perceptible.

No. 3, was brought to a great heat, both before hammering and rolling. The portion of the bar which was the most affected by the excess of heat, and which might besides be distinguishing by its exterior flaky appearance, presented brittle edges, a structure entirely crystaline, and with very fine grains. Another portion, a little farther from the point, was half crystaline and half fibrous, but with short fibres. A third portion, nearer the extremity was of a short fibrous texture, and had some small projectin gcrystals.

No. 4, which before hammering was less heated, and only carried to a suitable temperature before rolling, presented a fibrous texture, with some very small crystals, and was very similar to No. 2.

The granular portion of No. 3, having been heated nearly to welding heat, and again forged with a small hammer, the crystaline texture disappeared, and was changed into short fibrous texture. The portion, a little less granular, of No. 6, treated in the same manner, was of fine fibrous texture, of good quality, and a fine clear color.

The following facts result from these experiments, viz:

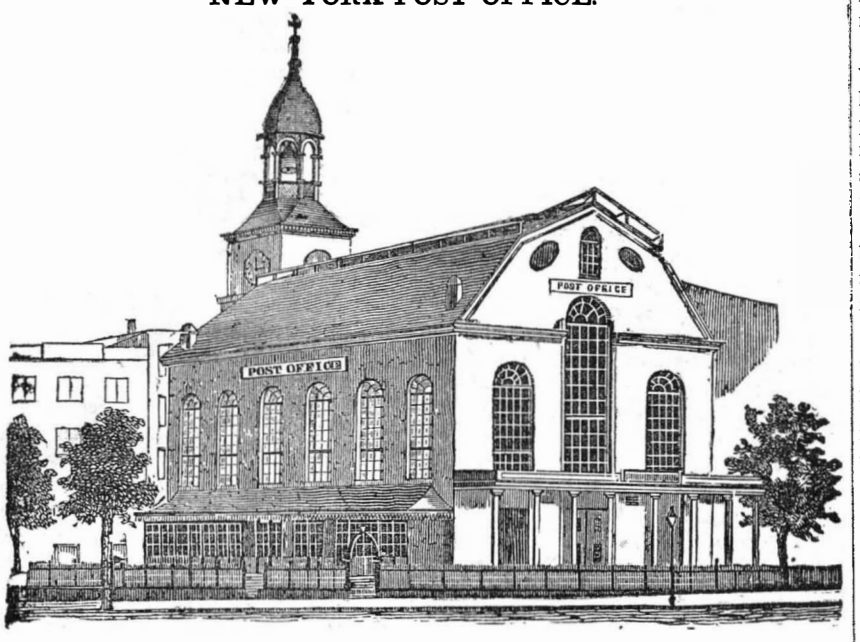
That No. 2 produced a fibrous iron, without crystals, when brought to a perfect welding heat, without, however, being overheated.—No. 3 furnished a granulated iron when the heat was too great. No. 4 preserved its fine fibrous texture, even when overheated before hammering, when not overheated in the furnace before the consecutive rolling.

No. 1 furnished a more granulated texture when heated before the last rolling, than when heated before the hammering; and, lastly, the principal result of this latter mode of treatment is, that the iron easily becomes deteriorated; but that iron, which by a previous operation has been overheated, and has consequently become granular, may be brought back to the fibrous state. The experiment made by re-forging the granular iron, No 3, is also in favor of this conclusion.

In practice, the property which wrought iron possesses of becoming granular under a great heat, is profited by. In fact, it has often been proved, that iron with a very fine grain may be easily drawn very fine without flaw, and even be cut in small dimensions without flying to pieces or breaking. It is from this observation that all nail-iron is split whilst very hot. The nails manufactured are perfectly pointed, without flaws, and may be tempered to any degree of hardness and tenacity required.

(*To be continued.*)

NEW YORK POST OFFICE.



This building is situated on Nassau street, between Liberty and Cedar streets, fronting on the latter. The interior of the building with its judicious and ingenious arrangements for post-office facilities, constitutes one of the principal curiosities of this curious city, and as such, is viewed with admiration by its thousands of visitors. Within the large central area, are several circular enclosures, about ten feet in diameter, and surrounded with tiers of boxes for the reception of papers distributed for the various mails: and it is curious to see with what dexterity the distributing clerks, who stand centrally within the circle, deposite the papers in the respective boxes. In front of these circles, are the arrangements for depositing, stamping and enveloping letters for the mails, and distributing and delivering letters to applicants. This area is partly surrounded by galleries, from which the spectator may leisurely survey the several operations. On the west side are arranged two windows for the general delivery of letters recently received; one for letters which have been advertised;—one in a separate apartment exclusively for ladies, and another for the delivery of newspapers. A commodious hall on the south is devoted to the mercantile letters and papers, and it is furnished with an immense number of private boxes and *pigeon holes* for the use of individuals. Over this hall are arranged the offices of the Post-master, Secretary and Cashier. On the south side, is the general entrance to the principal business offiices, and at the east or rear of the building on Liberty street, is a gateway approachable by carriages to the large elevated double doors by which all the mails are received and delivered, but without the possibility of the ingress or egress of the persons employed. As a whole, the N. York, Post Office is justly considered superior to any other in the United States; and the facility and accuracy with which hundreds of thousands of letters and papers are daily assorted and delivered or forwarded to their destination, within limited spaces of time, reflects credit on the perfect organization of the active, corresponding to that of the mechanical part of the establishment.

Learning In Old Age.

"Never too late to learn," says the old adage: but this must be understood in a very limited sense, for instances daily occur in which favorable opportunities for learning are passed and lost forever. There are thousands of instances, however, in which people excuse themselves from learning, even the most useful and agreeable arts and intelligence on the plea of being past the proper age for attending to these things. This excuse is generally inexcusable, and partakes more of indolence than propriety; and many worthy examples may he referred to, in which old people have successfully studied and learned arts, sciences and languages which had been neglected by them when young.

Socrates at an extreme old age, learned to play on instruments of music, for the purpose of counteracting the naturally gloomy effects of old age.

Cato at eighty years of age, thought it proper to learn the Greek language.

Plutarch when between seventy and eighty commenced the study of Latin.

Bocaccio was thirty five years of age when he commenced the study in polite literature, yet he became one of the three great masters of the Tuscan dialect, Dante and Petrach being the two others.

Sir Henry Spelman neglected the sciences in his youth, but commenced the study of them when he was between fifty and sixty years of age. After this time he became a most learned antiquary and lawyer.

Colbert, the famous French Minister, at sixty years of age returned to his Latin and law studies.

Dr. Johnson, applied himself to the Dutch language, but a few years before his death.

Ludovico Monaldesco, at the great age of one hundred and fifteen, wrote the memoirs of his own times. A singular exertion, noticed by Voltaire, who was himself one of the most remarkable instances of the progress of age in new studies.

Ogilby, the translator of Homer and Virgil, was unacquainted with Latin and Greek till he was past fifty.

Accerso, a great lawyer, being asked why he began the study of the law so late, answered that indeed he began it late, but he should therefore master it the sooner.

Franklin did not fully commence his philosophical pursuits until he had reached his fiftieth year. How many among us are there of thirty, forty and fifty, who read nothing but newspapers, for the want of a taste for natural philosophy! But they are *too old to learn*.

Overdone.

At the recent election in Ohio, some of the zealous politicians treated so liberally that some of the would be voters became so much intoxicated that the judges refused to receive their votes.

By advertising, thousands are informed at once, and *all at the same time*, of that which it would not be possible to communicate personally, in proper season.

© 1846 SCIENTIFIC AMERICAN, INC

NEW YORK, NOVEMBER 14, 1846.

The Eastern Telegraph.

If there is any one crime which more than others should excite universal indignation in the community, it is the sneaking villainy of cutting the wires of the magnetic telegraph.—The prevalence of this scoundrelism, if not checked by the vigilance of the whole community, appears likely to defeat the enterprise and deprive the public of the great and important benefits, as well as daily gratification, which should be derived from this greatest invention of the age, and which reflects much honor on our national character. Since the Boston line has been put in operation, the wires have been cut, broken, crossed or otherwise deranged in more than twenty places, and at nearly as many different times; and these interruptions have frequently occured just at the time that important news from Europe was expected. There have been various conjectures with regard to the motives which have induced this mischief; and it it supposed by some, to proceed from sheer envy against the rapidly advancing honor and prosperity of our country, under a system of free institutions and unbridled enterprise. But whether this mischief and vexation ts induced by this or other vile motives, let no measures be neglected which may tend to secure the rights of our citizens against the depredations of the malicious, and bring the recreants to justice. If our Legislators will not enact laws and establish penalties sufficiently severe, let the citizens of the principal cities and towns which are most benefited by the telegraph, combine and offer liberal rewards—$1000 or $5000—for the detection or conviction of any person, of injuring the telegraph. And let every citizen residing in the vicinity of the telegraph lines, make it a point to obtain all possible intelligence among his associates and neighbors, that may tend to the detection of the perpetrators of these outrages on the rights of the public, and the life blood of our national prosperity.

That Pedler.

A party of some hundreds of Miami Indians on their way to their new homes west of the Mississippi, encamped for a day or two on Bloody Island, where the youthful members of the party amused themselves with running races, and pitching quoits on the beach, while the older portion lamented their hard fortune in being compelled to leave their native forests. In a few minutes a boat was seen approaching the island, out of which marched a full blooded pedler with his boxes and basket filled with trinkets, when the old men suddenly forgot their sorrows and the younger ones their sports, and all crowded around the pedler in admiration of the well selected assortment. When our informant left, there were strong indications of trade going on, and the pedler no doubt got his share of the carefully saved small change which had prior to that occasion escaped equal attractions.

The Marriage Dissolved.

We several weeks since mentioned the marriage of a young lady of Patterson to a young man in the service of her rich father; and that she was immediately taken from her husband on a plea of insanity. We also intimated the probability that in consequence of the influence of wealth, the marriage would be annulled. The case has been recently tried and, as was expected, the jury decided that the young lady was insane at the time of the marriage; though we do not learn that any symptoms of insanity had appeared at other times. That is the sort of justice which is administered to the people, by modern judicial tribunes.

Remarkable Circumstance.

During five days last week, it rained atmost incessantly, flooding the streets of the city with large brooks, while at Norwich and Providence the weather was not only dry, but much of the time, clear and pleasant.

New Route to Oregon.

Mr. Jesse Applegate addresses a letter to the editors of the "Western States" with regard to a discovery which admits emigrants to the valley of the Williamette by a southern route

The new route follows the road to California about three hundred and twenty miles from Fort Hall, and enters the Oregon territory by the way of the Klamet Lake, passes through the splendid vallies of the Rogue and Umpqua rivers, and enters the valley of the Willamette near its southern extremity.

The advantage gained to the emigrant by this route is of the utmost importance. The distance is considerably shortened. the grass and water plenty, and the sterile regions and the dangerous crossings of the Snake and Columbia rivers avoided, as well as the Cascade mountains. This road has been explored, and will be opened at the expense of the citizens of Oregon, and nothing whatever is demanded of the emigrants.

The Iron Ship.

The revenue cutter built in Pittsburgh, of iron, is said to have cost $85,000, cheaper than any similar vessel constructed elsewhere.—The idea seems to prevail, that iron must be abandoned for the construction of vessels, in consequence of accidents and the apprehension of influence exercised over the needle; and yet it may be well to pause before iron ships are abandoned. They are undoubtedly lighter and stronger than wood. The best judges of ships declare that had the Great Britain been a wooden ship, she must have gone to pieces in the gale, and in the position in which she was stranded, and the lives of the passengers sacrificed. As it is, although she may not be extricated from the sandy bed, yet there is abundant evidence that she is remarkably strong and safe ; and we should not hastily withdraw our confidence from a material which promises great security in navigation. We have had several iron propellers in the coal trade, for some years, which are as sound and safe as the day they were first built, and requiring no repairs. Some improvements are yet to be made, but there is not sufficient proof to justify the entire abandonment of the use of iron in erecting vessels for commerce —*Sun.*

Cross Marriages.

Somebody says—but we don't believe it,—that he once knew a widow in Onondaga county, N. Y., who cut out her own daughter in the good graces of her lover, and married him herself! To obtain revenge for this mean, unmotherly trick, the daughter set her cap for the *young man's rich father* (of whom he was the only heir), and actually married him, and had children to the infinite annoyance of the other parties. Of course the children of each family were cousins, uncles, aunts, nephews, and nieces to those of the other.

The Ten Hour System.

The Manchester Democrat gives a case in point to show that employers are no losers by adopting the ten hour system. It says that a railroad contractor in that place, whose hands work on the old plan,—the pay of the hands being equal,—the ten hour contractor will have his job done in *one hundred days work less than the other.*

Four days later from New York.

This is the singular heading of an article in a New Orleans paper of the 20th ult. It says, " it is a singular caption, but we have been so long without a mail from New York, that a paper of a late date from that city is seized upon with almost as much avidity as Wilmer & Smith's Times on the arrival of foreign news. There were five mails due this morning."

Mechanics for the War.

Forty-three mechanics, composed of blacksmiths, carpenters, saddlers, armorers, &c., arrived in this city from Pittsburg, on Saturday. They are in the employment of the government, and receive about $45 per month and one ration per day. They are a fine looking, intelligent set of men, and it is gratifying that out of the evil of war comes the good of giving them employment and high wages. They leave for their destination to-day or to-morrow.—*Cincinnati paper.*

Southern Sentiments of Economy.

"The late census of Boston has developed some curious facts. There is no 'upper ten thousand' in that city—not if to keep servants be necessary to the distinction. Only *three hundred families* in Boston keep more than *two* domestics; and but four thousand four hundred and one families keep them at all; while fifteen thousand seven hundred and seventy-four families live in household independence, doing their own work entirely!"

The above paragraph, which we copy from an exchange paper, explains one important secret of Yankee prosperity. They live within themselves, and the result is that they not only live better than we at the South do, but at one half of the expense. A family of four persons say, in Boston has no servant at all, one of the same number at the South will have some three or four negroes We have known families in Georgia who employed six, eight, ten, and even as high as fourteen negroes upon their domestic affairs, and who, after all, complained often of being short of help! In fact, the comfort of a family is very often inversely in proportion to the number of servants employed; but the great objection to our system is its enormous expensiveness. All these negroes must be fed, and even if they are honest, they must cost nearly as much as is required to support the white portion of the family. To say nothing of the articles which they steal and sell, the very sustenance of such a swarm of servants is sufficient to bankrupt any man of ordinary means. This subject is worthy of attention, and we should be glad to have some articles upon it from some of our domestic economists. If we wish to overtake our New-England friends in the great race of prosperity, we must cease grumbling about tariffs and study their habits of economy. We must think more about ourselves and less about the lordly manufacturers.

[We copy the above sensible remarks from the "Savannah (Geo.) Republican," and would call the attention of the citizens of Raleigh to the subject. Every one must have observed the unusual number of lazy negroes spending their time in idleness about the streets, who, instead of being profitable, are a dead expense to their owners, and are, besides a public nuisance.]—*Raleigh Register.*

Ditto, for Greenborough.—*Greenborough Patriot.*

Canal at the Florida Isthmus.

The late destructive gale at Key West and in the neighborhood of the Florida Keys, will we hope, induce Congress to direct a survey of the Florida Peninsula for the purpose of incommencing and completing a ship canal uniting the Atlantic with the Gulf of Mexico, and avoiding not only a considerable distance in navigation, but those dangerous reefs, shoals and keys which are spread over the Bahama Banks. We do not know at present a more important and valuable project which in saving to underwriters alone will in a few years pay the expense of its construction, without reference to the great preservation of life and property, and the great saving of distance. The St. John's river and the St. Mary's, both navigable to a certain extent, can be used for some distance until connected with the canal, which, emptying into Vacassauka Bay, in the Gulf, would make the distance short of 120 miles, and the excavation over a level country considerably less. At all events, the period has arrived when something must be done for the security of our navigation to New Orleans and the Gulf of Mexico, and it can only be accomplished by a ship canal across the Florida Isthmus.—*Sun.*

Very Dead.

A shell from Lieut Rowland's howitzer having penetrated the roof of the Bishop's palace, buried itself in the body of a Mexican, and there exploded, tearing the poor fellow to rags. An American soldier on viewing the scene afterwards remarked "That man is killed *very dead.* I never saw a man *killed so dead* before."

The Cabotville Bridge.

The new bridge over the Chicopee River, at Cabotville, is now completed. It is built after Towne's patent, with Damon's improvement, and is covered.

James Watt's Boyhood.

A friend of Mr, Watt one day came upon young James, stretched upon the ground, tracing with chalk all kinds of cross lines.—"Why do you suffer this child thus to trifle away his time ?" exclaimed the visiter; "send him to school." "You will do well to delay your judgment," said the father ; "before condemning him, be good enough to find out his occupation." The harsh judgment was speedily reversed. The child of six, was solving a problem in geometry. "James," said Mrs. Muirhead one day to her nephew, "I never saw any boy more given to trifling than you are ; can't you take a book, and employ yourself usefully ? There have you been sitting a whole hour without speaking a single word. Do you know what you have been about all this time ? You have done nothing but shut and open, and open and shut the lid of the tea kettle; and, first, you have put the saucer in the steam from the spout, and then you have held the silver teaspoon in it; and then you have done nothing but pore over them and bring together the drops formed by condensation on the surface of the china or the spoon. Arn't you ashamed of spending your time in that way."—[M. Arago's Eloge,

Interesting Facts.

Large waves proceed at the rate of about 35 miles an hour. Many suppose that the water advances with the speed of the wave, but it is not so : the form of the wave only advances excepting a little spray, while the water remains rising and falling in the same place.

The moon is 230,000 miles distant from the earth. With an instrument that magnifies a thousand times, she appears but 230 miles off. The moon is but the fiftieth part of the bulk of the earth.

The five different races of men are—the European, white ; the African, black ; the Malay, brown , the Asiatic, yellow ; and the American, red.

Lightning travels with a velocity twice as great as that of light, being at the rate of 24,000,000 miles a minute.

The surface of the sun contains 2,432,300,000,000 square miles.

There will not be a total eclipse of the sun in America, until August 7, 1869.

Deep Distress.

The Portland Argus says, that an agent has been into the county of Franklin, Me , drumming up girls to go in the Lowell factories.—This agent has $1 a head for every girl that he sends on. There seems to be great distress in the factories at present, but not of the kind the panic makers pretend. It is a distress created by a press of work beyond the ability of the operatives engaged, to perform—a distress for the girl—and not from failure of business.—*Boston Transcript.*

This circumstance is easily explained.—The proprietors have taken occasion to reduce the wages of the operatives, which has caused many to leave the mills ; on this account they have to drum up new recruits.

Modern Honesty.

A gentleman was at a stable buying a horse, and wanted to see his motions. The horse trader called the boy, to come and ride the horse, and he accordingly mounted; but not having heard the previous conversation, the boy was at a loss how to proceed, till he called his master to him and asked him in a low voice, which rather unluckily was overheard, "Sir, am I to ride him to sell by or to buy by ?"

THE
SCIENTIFIC AMERICAN.

Persons wishing to subscribe for this paper, have only to enclose the amount in a letter directed (post paid) to

MUNN & COMPANY,

Publishers of the Scientific American, New York City.

TERMS.—$2 a year; ONE DOLLAR IN ADVANCE—the remainder in 6 months.

Postmasters are respectfully requested to receive subscriptions for this Paper, to whom a discount of 25 per cent will be allowed.

Any person sending us 4 subscribers for 6 months, shall receive a copy of the paper for the same length of time.

© 1846 SCIENTIFIC AMERICAN, INC

Information to persons having business to transact at the Patent Office.

Continued from No. 7.

SEC. 81. FORM OF ASSIGNMENT BEFORE OBTAINING LETTERS PATENT AND TO BE RECORDED PREPARATORY THERETO.

Whereas, I Sebastian Cabot, of Cabotville, in the county of Hampden, and State of Massachusetts, have invented certain new and useful improvements in the boilers of steam engines, for which I am about to make application for letters patent of the United States; and whereas John Doe, of Cabotville, aforesaid, has agreed to purchase from me all the right, title and interest which I have, or may have, in and to the said invention, in consequence of the grant of letters patent therefor, and has paid to me, the said Cabot, the sum of five thousand dollars, the receipt of which is hereby acknowledged. Now, this indenture witnesseth, that for and in consideration of the said sum to me paid, I have assigned and transferred, and do hereby assign and transfer, to the said John Doe, the full and exclusive right to all the improvements made by me, as fully set forth and described in the specification which I have prepared and executed, preparatory to the obtaining of letters patent therefor. And I do hereby authorize and request the Commissioner of Patents to issue the said letters patent to the said John Doe, as the assignee of my whole right and title, thereto, for the sole use and behoof of the said John Doe and his legal representatives.

In testimony whereof, I have hereunto set my hand, and affixed my seal, this first day of March, 1838.

SEBASTIAN CABOT, [L. S.]

Witness: { A. B., C. D.

SEC. 82. FORM OF OATH ON RESTORING DRAWINGS, OR SKETCHES FROM WHICH DRAWINGS MAY BE MADE, TO REPLACE THE ORIGINALS DESTROYED IN THE OFFICE.

County of Hampden, State of Massachusetts:

On this first day of March, 1838, before the subscriber, a

personally appeared Sebastian Cabot, of Cabotville, in the State of Massachusetts, and made solemn oath that he is the inventor, [or is interested in the invention as administrator, &c.] of an improved mode of preventing the explosions of steam-boilers, for which letters patent of the United States were granted to him, dated the first day of January, 1835, and that the annexed drawing [or sketch] is, as he verily believes, a true delineation of the invention described in the said letters patent.

SEC. 83. If the following questions can be answered affirmatively, before transmitting the papers, few applications will be returned for correction of ommissions:

1. Is the fee transmitted?
2. Is the petition signed, and addressed to the Commissioner of Patents?
3. Is the specification signed, and witnessed by two witnesses?
4. Are the drawings described, and referred to in the specification? If not are they signed before two subscribing witnesses, and are they accompanied with written references?
5. Are duplicated drawings sent?
6. Has the inventor made oath to his being a citizen, and that his invention is new, &c.?
7. Does the specification contain a specific claim?
8. If an alien and resident, is this affirmed and sworn to?
9. Has the model been sent, and how?
10. Is the name of the inventor durably affixed to the same?
11. In case of reissue, is the old patent surrendered?
12. Has the oath of invention been renewed, before appealing from the decision of the Commissioner?
13. Have the fees been remitted in coin, or by certificate of deposit?
14. In case of reissue, disclaimer, addition of an improvement, or patent for an improvement on an existing patent to inventor, assignee, or possessor of the original patent, have model and drawings of the original patent (if granted before the 15th of December, 1836) been transmitted?

INFORMATION.

Under the Act of August 29, 1842.

ART. 1. This act authorizes the Treasure of the United States to repay any money which has been paid into the Treasury by actual mistake, as for patent fees; thus precluding the necessity of special application to Congress for relief.

ART. 2. The privilege of renewal of lost patents is now extended to those *granted* before the fire of December, 1836. Heretofore it has been limited to those actually *lost* before the fire, thus excluding many lost subsequently, and before they were recorded anew in this office, leaving the inventor without remedy.

ART. 3. Protection is by this act extended to a *new* plan of objects, viz:

To new and original *Designs*:

—for a manufacture of metal and other materials;

—for the printing of woollen, silk, cotton, or other fabrics;

—for busts, statues, or bas relief, or composition in alto or basso relievo;

—for any impression or ornament, or to be placed on any article of manufacture in marble or other material;

—for any new or useful pattern, print, or picture, to be in any manner attached to, or fixed on, any article of manufacture;

—for any new or original shape or configuration of any article of manufacture;

all such designs not being previously known or used by others.

ART. 4. American ministers, consuls, &c., residing abroad, may administer the oath required for applicants not resident in the United States. Heretofore such functionaries were not authorized to perform this act, thus subjecting applicants, in foreign countries, to much inconvenience.

ART. 5. The stamping or affixing the name of any patentee on any article without authority so to do, or the affixing the word *patent*, or *letters patent*, or the stamp, mark, or device of any patentee on any unpatented article, for the purpose of deceiving the public, is forbidden under a penalty of not less than one hundred dollars.

ART. 6. Patentees, or their assignees, are now required to affix the date of the patent on each article vended or offered for sale under a like penalty—thus affording the public notice of the duration of the patent When the article is of such a nature that the date cannot be printed thereon, it should be affixed to the case or package containing it.

It will be observed that this act does not repeal or change the law under which patents have heretofore been granted, but is merely additional thereto—all patents, except for *designs*, being granted for fourteen years, and the fee, as hitherto, being thirty dollars.

Before the grant of any patent under this act, the application must be made by petition to the Commissioner of Patents, signed by the inventor.

He is also required to furnish a written description or specification of his invention or production, in which the same shall be fully and clearly described; such specification to be signed, witnessed by two witnesses, and verified by his oath or affirmation.

In all cases which admit of representation by drawings, the application must be accompanied by duplicate drawings and a specimen; and in other cases by duplicate specimens.

The provisions of the 6th section do not apply to Patents granted prior to the passage of this act.

(*To be continued.*)

The Biter Bitten.

We heard yesterday of a case in this country, which happened recently, where a dashing youth undertook to punish a *coquette*.—He courted the lady, won her affections, and prepared to leave her "to waste her sweetness on the desert air;" but at this stage of the proceedings the young lady's brother stepped in and offered the "dem fascinator" a choice between pistols and matrimony. Of course he selected the most agreeable way of settling the difficulty, and *married* the fair one.—*St. Louis Reveille.*

Seven hundred and seventy-eight steerage passengers arrived at New Orleans on the 29th of October.

CHEMISTRY.

Continued from No. 7.

EQUIVALENT RATIOS.—The result of these investigations have been the formation of scales exhibiting the equivalent ratios of chemical bodies, and which are expressed by numbers. It is evident that some body must be fixed upon, and expressed by unity. Hydrogen gas, being the lightest known body in nature, and combining the smallest proportion by weight with the other simple substances, has been taken as a standard of comparison for the combining proportions, or *equivalent numbers*, of all other bodies; and which, in all likelihood, are simple multiples of its number. Oxygen has also, by some chemists, been taken as the standard of comparison, and represented by ten. Water is a compound of eight parts by weight of oxygen, with one part by weight of hydrogen; which two gaseous bodies we shall afterwards describe. Whenever hydrogen and oxygen gasses are burnt in any proportion whatsoever, they invariably form water; and they cannot be made to combine directly in any other proportion. From this, Dalton concluded that water is a compound of one atom of dydrogen and one atom of oxygen. But the weight of the latter gas being eight times that of the former, then it followed that the atom of oxygen was just eight times heavier than the atom of hydrogen. Hence, if the latter be represented by one, then will the former be represented by eight, according to those who take hydrogen as the standard, Those who take oxygen as the standard, and represent it by 10, make the equivalent for hydrogen 1.25: the result is of course the same, the proportion of 1.25 to 10, being exactly the same as that of 1 to 8.

These observations relative to water lead us to speak of the doctrine of volumes, so generally embraced by chemists upon the Continent. The union of gasses is always effected in simple proportions of their volumes; and a volume of one gas combines with an equal volume, or two or three times the volume, of another gas; and in no intermediate proportion.

ELEMENTAL BODIES.—With regard to the elements of matter, chemists have agreed among themselves to consider all those bodies as simple which have not yet been decomposed. As already mentioned, the simple bodies are fifty-four in number, and for the convenience of study, they have been arranged into classes. One system of classification is dependent upon the elements being metallic or non-metallic.

The non-metallic elements are divided into *gazolytes*, or bodies which are permanently gaseous; *metalloids*, or bodies which resemble the metals in their chemical relations; and *halogens*, or bodies which produce salts when in union with the metals. The non-metallic elements are thirteen in number; namely, oxygen, hydrogen, nitrogen, chlorine, iodine, bromine, fluorine, carbon, boron, silicon, sulphur, selenium, and phosphorus. The three first are the gozolytes, the next four the halogens, and the remaining six the metalloids. The metallic elements ore forty-one in number, namely, potassium, sodium, lithium, calcium, barium, strontium, magnesium, aluminum, thorium, glucinum, zirconium, yttrium, manganese, zinc, iron, tin, cadmium, cobalt, nickel, arsenic, chromium, vanadium, molybdenum, tungsten, columbium, antimony, uranium, erium, bismuth, titanium, tellurium, copper, lead, mercury, silver, gold, platinum, paladium, rhodium, osmium, iridium. These metallic elements are again divided into three orders, the first twelve being the bases of the alkalies and earths; the next twenty-one being metals whose oxides are not reduced by heat alone; and the remaining eight, metals whose oxides are reduced by a red heat. From these fifty-four elementary substances is formed all the beautiful variety of terrestrial objects. Nor is there any thing either very wonderful or mysterious in this fact, since, as we have seen, any given two of them, if made to unite in different proportions, can be made to produce the most opposite substances. These, again, united with each other, give rise to new compounds, which are susceptible of being combined, and so on through an almost indefinite rotation of chemical union.*

* From recent experiments in chemistry, there is reason to believe that all substances whatsoever are but modifications of one primitive substance. The absolute truth of this startling theory remains to be practically demonstrated.

HUMOROUS.

Captain Smith's Bear Story.

A correspondent of the Newark Daily Advertiser gives the following recipe for getting rid of one's neighbor's hogs:

"About the year 1830, I settled at the Lower Peach Tree, in Wilcox county, Alabama, and cultivated a few acres in corn and cotton, besides a small potato patch and bit of garden, as was usual in those days. My nearest neighbor, John Champion, being better off than the rest of us, had a nice gang of hogs, and feeling a little above his neighbors on account of his wealth, and being rather an overbearing man too, was not particular whether his stock broke into other people's fields or not. My crop was too small to feed my own family and John Champion's hogs, too, so I complained to him several times, but could get no relief, when, being at old Erasmus Culpepper's house one day, I heard him make the remark, that if a foot, or an ear, or even a small piece of bear skin was thrown down in a place where hogs *use*, that they would never show their snouts there again. I went home and got the skin of a bear which I had killed some time before, and having supplied myself with some corn, I went out and saw about twenty year-olds munching away in my field. I 'tolled them up,' and catching a good runner, sewed him up in the bear skin, and then turned him loose, when he ran after the rest, who flew from the supposed bear. The last that was seen of them was at Basset's Creek, near forty miles from my house, only two being alive—one running from his fellow sewed up in the skin, and he trying to catch the other—the rest were found dead, having literally ran themselves to death. It is needless to add that John Champion's hogs staid at home after that.

Modern Curiosities.

We recently inserted a small list of whimsical imaginary curiosities (principally borrowed from another paper) since which this kind of commodity appears to have become much the vogue, not to say the rage in many of our exchanges. Several lists have appeared in the Boston Post, which are more disgusting than amusing on account of the aimed burlesque on items of Scripture history, which abound therein. From other papers we select the following, which display a tolerable degree of quaintness.

The conscience of a lawyer magnified a thousand times, so as to be visible to the naked eye. A great curiosity.

The chrystaline lens of the Wind's eye, caught and presented by Capt. ——.

A feeler of the great hum-bug,—foreign market; two inches long.

The daguerreotype likeness of a disinterested office-seeker.

The tail of an Irish Bull.

Sand from Time's hour glass.

A quandary with a man in it.

Half a dozen feathers from a gin cock tail.

A fishing rod and walking stick, made of hurricane.

A knock down argument and the impression it made.

A pound of butter from the cream of a joke.

A fluke from the anchor of Hope.

A finger post from the road to ruin.

The cap of a climax.

Some of the eels that were used to being skinned.

A pair of pointers from the great bear; well trained,

The War.

"What makes taters so high?" inquired an old lady of the market man, as she was purchasing.

"Oh, the war, ma'am."

"But do they fire taters at tha Mexicans?" responded the old lady, "why that is funny?"

Singular Superscription.

A letter was lately received at the Post Office at Worcester, Mass., with the following in addition to the ordinary address of a lady:—"Dont Let Noperson have this Letter but Hir Self She is a Large Woman if She Dont Call Dont Let it Go?"

All judicious persons shut their eyes when they look up chimney so that soot may not fall into them.

© 1846 SCIENTIFIC AMERICAN, INC

LATEST FROM EUROPE.

The Steamship Britannia arrived at Boston on Saturday last from Liverpool. The Britannia brought 92 passengers, among them a large number of grain speculators, not only from England, but from other parts of Europe. She encountered very rough tempestuous weather during most of the passage. Storms of unparalleled fury had raged in all parts of the globe. At sea, an immense amount of property has been destroyed, and columns of the English papers are filled with accounts of marine disasters.

The deplorable condition of Ireland engrosses public attention in the British Islands.—The famine continues to spread over that unfortunate country. Diseases of a malignant type are also adding to the horrors of the scene.

The marriages of the Queen of Spain and her sister have been consummated, without producing anything more serious than protests from England and one or two other European powers, against the alliance with France, which are intended to form the bases of future interventions, should occasion require.

There appears to be some apprehension that this new alliance between France and Spain, may lead to an attempt to recover to Spain the South American States.

The Great Britain still remains aground, notwithstanding every effort to remove her. She lies in twelve feet water between two rocks. The proprietors propose to construct some new and powerful machinery for removing her.

On the 7th October the tide of the river Thames rose to an alarming height, causing a serious destruction of property situate in all the low lying cellars and warehouses near the water side.

The marriage of the Duke de Montpensier and the Infanta of Spain, was duly celebrated on the 10th ult. Montpensier gets with his bride, a fortune of about $7,000,000.—Louis Phillippe pardoned one hundred prisoners, on the occasion of the marriage of his youngest son.

The opinion prevails in Europe that the failure of the potatoe crop is a prelude to the entire extinction of the root, and that its revival is hopeless. There is also said to be signs of a general dearth in Europe, such as has never been experienced.

Late from the Army.

Intelligence from Monterey, to the 12th Oct. has been received. Of the Mexicans who left Monterey after the siege, very few have returned, and few remain in the city. The troops occupy the city and are engaged in fortifying and strengthening its position. Several regiments are encamped three or four miles to the north. Our troops had not heard of the subsequent movements of Santa Anna, and of his march towards Monterey, although rumors to this effect were circulating in camp. The arrival of the Government Courier will enlighten them. As far as ascertained, the killed and wounded on our side amounts to 571, a small amount when contrasted with the dangerous exposure of our troops in the street fight. The Mexicans lost 1200, and had 8000 regulars.—But of 350 Tennesseans in the action, 117 were killed or wounded. All the forts were in our possession before the armistice, with the exception of the citadel. Hence the opposition to the terms granted.

Gen. Taylor's Movements.

Letter writers who appear to know, state that as soon as Gen. Taylor shall receive his orders from Washington, he will move forward to Saltillo, and thence fight or no fight, to San Luis Potosi. Monterey, where the General was at last dates, appears to be not more than 200 miles S. W. from Camargo, on the Rio Grande. Saltillo is in Coahuila, S. S. W. from Monterey, distance less than 100 miles.—San Luis Potosi is the capital of the State or Province of the same name, and is N. N. E. from Saltillo, distance about 300 miles. It is less than 100 miles from Mampice. San Luis Potosi is the point at which it is said the troops of Mexico were ordered to the centre! If, then, Gen. Patterson, with his command o volunteers, has been ordered to Tampico, he will have some enemies in front, and old Rough and Ready to back him.—*N. O Delta.*

New Sun Dial.

We have inspected Thomas Read's newly invented Sun Dial, and think that he has accomplished that useful and long sought for desideratum, the establishment of a convenient standard of time for regulating clocks, watches, &c. and thereby enhancing the value of these useful instruments. This Dial, by discarding all superfluous parts, is made so large as to be graduated to minutes, that may be subdivided by the eye into quarter minutes; so accurate as to be warranted to a few seconds; and so cheap as to afford no obstacle to its introduction into common use. The hour lines from sunrise to a quarter to eleven are engraved on a straight plate; made to stand in the meridian and to make an angle with the horizon equal to the complement of the latitude of the place; thus suiting it to every latitude. But as a quarter to twelve on a plate in this position, calculated to the radius of this dial, would require the plate, now but twenty five inches, to be extended to the length of 169 feet therefore, before the hour lines begin to extend themselves too much, the plate is bent at right angles with the face of the plane; and this bent plate forms the section of a plane nearly vertical throughout the United States On this plate the hours from ten to one are engraved in a moderate compass. Another peculiarity in this disc is, that every minute line is calculated separately for a certain part of the sun's disc, which experiment has proved to be the mean of the spot from which the shadow is projected; thereby avoiding an error, heretofore universally and erroneously attributed to refraction, of from 4 to 20 seconds. So simple are sun dials when fixed, that a child will read off the time more readily than from a clock, and they require no attention or repair, and will last as long as the materials will endure. Sun dials will give solar time, which by the bye, is *true time*, but which may be readily converted into mean time. by the equation table, given with the dial, or found in an almanac. The difference for more than half the year does not exceed 3 or 4 minutes. Sun dials, besides establishing a true standard of time, are useful for recording the latitude, and cardinal points; for ascertaining small differences of longitude, and the variation of the compass: for finding the angles that the boundary lines of estates make with the true meridian; and for the solution of all those astronomical and mathematical problems that are dependent upon a knowledge of the true time. Longitude may be known by comparing the time given by the dial with the correct time of any place whose longitude is determined. For instance, if a well regulated watch, set by chronometer in New York, gives, allowing for the equation, half a minute more time than a sun dial in Catskill, then Catskill is seven and a half minutes east of New York, that is its longitude is 73° 55' 35", New York being 74° 3' 5".

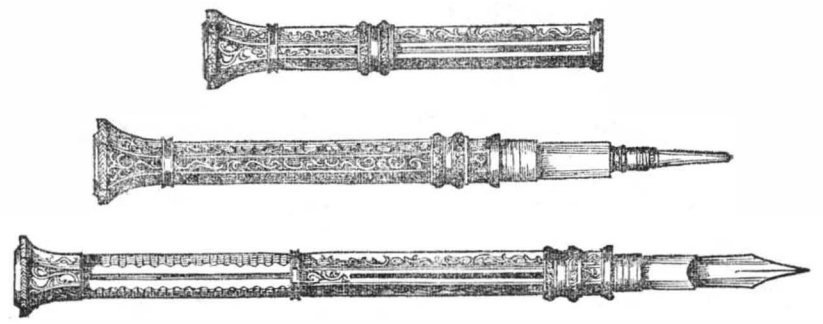
The dial may be seen at Mr. S. Fleet's Mechanics' and Merchants' Agency, 34 Ann st., New York.

Spring Cars for Railroads.

We alluded to this snbject about three weeks since and presented rather an unfavorable view of the subject of propelling cars or carriages by coiled springs. But we have recently received intelligence from a gentleman who occupies a conspicuous relation in the circle of practical and scientific mechanics, that he has devoted considerable time and expense to experiments on the subject, and has succeeded in running a light car several miles by the power of springs, and that with extraordinary speed. We are promised a descriptive communication on the subject for our next paper, and may accompany it with an illustrative engraving.

Fine Spinning.

The silk-worm's thread is so fine that one ounce of it will extend a distance of *thirteen hundred and sixty miles*. The same weight of a common grass spider's thread will reach 1500 miles.



Bagley's Patent Extension Penholder and Pencil.

THIS is the most compact, complete, convenient and useful pocket companion ever offered to the public. The multiplicity of its usefulness and the smallness of its size, renders it a perfect MULTUM IN PARVO.

In the short space of 2 3-4 inches is contained a Pen, Pencil, and a reserve of leads, and by one motion slides either the pen or the pencil out and extends the holder to six inches, which is but little more than half the length, when shut up, of the common pen holder, but when extended is one fourth longer. This article is secured by two patents, and the Manufacturers are now ready to receive orders for them in any quantity, either of Gold or Silver, together with his celebrated ever pointed Gold Pens, which need no proof of their superiority except the increased demand for the last six years, and the numerous attempts at imitation.

A. G. BAGLEY, No. 189 Broadway.
New York, Sept. 1, 1846. o24 tf

The Chess Palladium and Mathematical Sphinx;

A Monthly Magazine, devoted to the Curiosities of Chess, and the Ingenuities of Arithmatic: with Problems, also, in Chequers.—Taylor & Co., Astor House, N. Y., Publishers. The second number of this elegant, curious and entertaining publication is before us, and is embellished with *ten beautiful Chess and Chequer Problem Diagrams*, and contains much other instructive matter connected with the profound and intellectual science of Chess.—A $5 *Chess Prize Problem*, and a $5 Mathematical one, also, is offered, Solutions are given to all the ingenious Problems in No. 1. The publishers say that those at a distance who are interested in these subjects, will receive a specimen No. *gratis*, on application (post-paid) to "Palladium, N. Y. city." Its terms are $2 per annum, half in advance.

The Olive Branch.

This interesting and very popular paper, appears in an entirely new and beautiful dress throughout, which not only indicates prosperity but evinces a determination on the part of the publisher, to maintain its title to public favor. The Olive Branch is published at Boston by H. C. Goodwin, at two dollars a year.

Our next Number.

We anticipate,—and consequently authorise others to anticipate,—that our next number will be a more than usual interesting paper. and will present, with other novelties, an engraving and description of the monster steam engine constructed for draining the Haarlem Lake.

ADVERTISEMENTS.

☞ THIS paper circulates in every State in the Union, and is seen principally by mechanics and manufacturers. Hence it may be considered the best medium of advertising, for those who import or manufacture machinery, mechanics tools, or such wares and materials as are generally used by those classes. The few advertisements in this paper are regarded with much more attention than those in closely printed dailies.

Advertisements are inserted in this paper at the following rates:

One square, of eight lines				one insertion,	$ 0 50
"	"	"	"	two do.,	75
"	"	"	"	three do.,	1 00
"	"	"	"	one month,	1 25
"	"	"	"	three do.,	3 75
"	"	"	"	six do.,	7 50
"	"	"	"	twelve do.,	15 00

TERMS:—CASH IN ADVANCE.

Branwhite's Patent Color Discriminator.

☞ This ingenious invention consists of a neat box in which are arranged in a scientific manner, all the most brilliant colors, THIRTY FIVE IN NUMBER, represented by as many convex discs of the FINEST SILK. Each disc bears a number referring to an explanatory scale. The attention of storekeepers, milliners, and indeed all who have occasion to vend or purchase colored articles of any kind, is respectfully invited to this new and valuable discovery. More trouble can be saved by its use in ONE DAY than four times the amount of its cost. For sale, wholesale and retail, at the office of the Scientific American, 128 Fulton st., 3 doors from the Sun Office.

They may be sent by Express, to any part of the United States. oct31 tf

Engraving on Wood

NEATLY AND PROMPTLY EXECUTED AT the OFFICE OF THE SCIENTIFIC AMERICAN, 128 Fulton st, three doors from the Sun Office. Designs, DRAWINGS of all kinds for PATENTS, &c., also made, as above, at very low charges. 1

GENERAL AGENTS
FOR THE SCIENTIFIC AMERICAN.

New York City, - GEO. DEXTER.
" " - WM. TAYLOR & CO.
Boston, - - - - - MESSRS. HOTCHKISS & CO.
Philadelphia, - - - MESSRS. COLON & ADRIANCE.
Boston, - - - - JORDON & WILEY.

LOCAL AGENTS.

Albany, - - - - PETER COOK.
Baltimore, Md., - - S. SANDS.
Cabotville, Mass., - - E. F. BROWN.
Hartford, Ct., - - E. H. BOWERS.
Lynn, Mass, - - - J. E. F. MARSH.
Middletown, Ct., - - WM. WOODWARD.
Norwich, Ct., - - - SAFFORD & PARKS.
New Haven, Ct., - - E. DOWNES.
New Bedford, Mass., - WM. ROBINSON & CO.
Newark, N. J., - - J. L. AGENS.
Newark, N. J. - - - Robert Kashaw.
Providence, R. I., - - H. & J. S. ROWE.
Springfield, Mass., - - WM. B. BROCKET.
Salem, Mass., - - - L. CHANDLER.
Troy, N. Y., - - - A. SMITH.
Taunton, Mass., - - W. P. SEAVER.
Worcester, Mass., - - S. THOMPSON.
Williamsburgh, - - J. C. Gander.

TRAVELLING AGENTS.

O. D. DAVIS, JOHN STOUGHTON, SYLVESTER DIERFENDORF.

CITY CARRIERS.

CLARK SELLECK, SQUIRE SELLECK, NATHAN SELLECK.
Persons residing in the city or Brooklyn, can have the paper left at their residences regularly, by sending their address to the office, 128 Fulton st., 2d floor.

ELECTRICITY.

SMITH'S CELEBRATED TORPEDO. OR VIBRATING ELECTRO MAGNETIC MACHINE—This instrument differs from those in ordinary use, by having a third connection with the battery, rendering them much more powerful and beneficial. As a CURIOUS ELECTRICAL MACHINE, they should be in the possession of every one, while their wonderful efficacy as a medical agent, renders them invaluable. They are used with extraordinary success, for the following maladies.

RHEUMATISM—Palsy, curvature of the Spine, Chronic Diseases, Tic-doloureaux, Paralysis Tubercula of the brain, heart, liver, spleen, kidneys, sick-headache.

TOOTHACHE—St Vitus dance, Epilepsy, Fevers, diseases of the eye, nose, antrum, throat, muscles, cholera, all diseses of the skin, face, &c.

DEAFNESS—Loss of voice, Bronchitis, Hooping cough.

These machines are perfectly simple and conveniently managed. The whole apparatus is contained in a little box 8 inches long, by 4 wide and deep. They may be easily sent to any part of the United States. To be had at the office of the Scientific Americcan, 128 Fulton st, 2nd floor. (Sun building) where they may be seen IN OPERATION, at all times of the day and evening. 2

G. Marsh & Co.

Manufacturers of Tin Cylinders for SPINNING FRAMES.

PALMER, MASSACHUSETTS.

o244t*

COPPER SMITH!—The subscriber takes this method of informing the public that he is manufacturing Copper Work of every description. Particular attention is given to making and repairing LOCOMOTIVE tubes. Those at a distance, can have any kind of work made to drawings. and may ascertain costs, &c., by addressing L. R. BAILEY, cor. of West and Franklin sts., N. Y.

N. B.—Work shipped to any part of the country. 45to2dv18*

BRASS FOUNDRY.

JAMES KENNEARD & CO. respectfully inform their friends and the public that they are prepared to furnish all orders for Brass and Composition Castings, and finishing in general at the shortest possible notice.

N.B. All orders for Rail Road, Factory and Steamboat work from any distance, will be thankfully received and attended to with despatch and on reasonable terms.

☞ Patterns made to order.

JAMES KENNEARD & CO.
oct. 10 3m* 27 1-2 Chrystie st. New York.

AMERICAN AND FOREIGN PATENT AGENCY,

No. 23 Chambers street, New York.

JOSEPH H. BAILEY, Engineer and Agent for procuring Patents, will prepare all the necessary Specifications, Drawings, &c. for applicants for Patents, in the United States or Europe. Having the experience of a number of years in the business, and being connected with a gentleman of high character and ability in England, he has facilities for enabling inventors to obtain their Patents at home or abroad, with the least expense and trouble.

The subscriber, being practically acquainted with all the various kinds of Drawing used, is able to represent Machinery, Inventions, or Designs of any kind, either by Authographic Drawing, or in Isometrical, Parallel, or True Perspective, at any angle best calculated to show the construction of the Machinery or Design patented.

To those desiring Drawings or Specifications, Mr. B. has the pleasure of referring to Gen. Wm. Gibbs McNiel, Civil Engineer, Prof. Renwick, Columbia College, Prof. Morse, Jno. Lee.

Residence, No. 10 Carroll Place; office, No. 23 Chambers street. oct10 tf

© 1846 SCIENTIFIC AMERICAN, INC

Composition for rendering Cloth Waterproof.

The following is the method invented by Nathaniel Hatch, Eastport, Me., and patented March 23d, for producing a glossy elastic waterproof surface on cotton cloth, suitable for table-spreads, carriage tops &c.

"Take half a pound of gum shellac, and one pint of alcohol, and put them in a tin kettle with a cover, and suspend the kettle with said contents in a boiler of boiling water, and keep the heat up till the gum dissolves, then put one quart of boiled linseed oil in the kettle with the shellac, and boil them together till they are well mixed. Secondly, take one ounce of India rubber, cut it in very small pieces, and one quart of spirits of turpentine, and put them in another tin kettle with a cover as before named, and suspend it, with the contents, in a boiler of boiling water, and keep the heat up till it is dissolved: then put two quarts of boiled linseed oil in the kettle with the rubber, and keep the heat up till they are completely mixed. Thirdly, take one pound of yellow hard soap, and two quarts of water, and boil them together till the soap is all dissolved.

"Then to make the composition, take 8 lbs. white lead ground in oil, 1 gill coal tar, 6 ounces lamp black, 1 lb. gold litharge, 4 quarts boiled linseed oil, 3 quarts of the above named solution of India rubber, 1 gill of the solution of shellac, as above named, 1 pint of copal varnish, and mix them all well together.—Then put one quart of the soap and water in the composition while the soap and water are boiling hot, and stir them together till the whole is completely mixed together, and then apply the composition to the cloth with a common paint brush, and when the cloth is nearly dry, so that it will not rub off, apply the second coat of the composition, and when second coat is nearly dry, apply the third coat of the composition, which makes the cloth waterproof and pliable. If I want to make any other color, I put other colored paint in, enough to make such a color as I want, namely—to make yellow, I take chrome yellow; or for green, I take chrome green; and to make white, I leave out the lamp black, &c."

Sconbein's Explosive Cotton.

We noticed a few weeks since, a curious discovery in Europe, by which cotton was so prepared as to explode with all the force o effects of gunpowder. We were somewhat suspicious of the genuineness of the report, but from more recent intelligence it appears that there is at least something curious, if not useful, in the discovery. It is said to have been submitted to a board of artillery and engineer officers, who, after a series of experiments and trials of its powers with muskets and rifles, have reported most favorably of its value and utility as respects small arms, and recommended that further experiments be made upon a larger scale, with a view of testing its applicability to heavy ordnance.—There, is, moreover, a pretty good anecdote of the exhibition of this explosive cotton at the Osborne House, in the presence of Prince Albert and others. Mr. Schonbein offered to explode a portion on the hand of Col. B———, but the gallant Colonel recoiled from the experiment, and would have nothing to do with the novel power. Prince Albert, himself, however, submitted to the test; and off went the cotton, without smoke, stain or burning of the skin. Thus encouraged, the Colonel took his turn, but whether the material was changed or not for the coarser preparation, it gave him such a singeing that he leapt up with a cry of pain. A hearty laugh was all the commisseration he received. After this, Mr. Sconbein loaded a fowling piece with cotton instead of powder, and the prince fired both ball and shot from it with the usual effect and perfect impunity. Deducting 75 per cent of these reports for gossip, and we are left to conclude that *cotton* (like saltpetre) *will explode*. And should fashion take a freak to introduce wearing apparel made of this prepared cotton, young ladies who travel by railroad will have more than ordinary occasion to "beware of sparks."

Wire Bridges in Switzerland.

There are two Suspension Bridges in Freburg—one remarkable for its length, the other for its extreme beauty. The latter connects the tops of the two mountains, swinging over a frightful gulf, and makes one dizzy to look down into it. There are no buttresses or mason work. Shafts are sunk into the solid rock of the mountains, down which the wires to sustain it are dropped, on which it stretches a mere black line, nearly 100 feet in the heavens, from summit to summit. It looks like a spider's web flung across a chasm—its delicate tracery showing clear and distinct against the sky. While you are viewing the fairy creation suspended in mid-heaven almost, expecting the next breeze will waft it away, you see a heavy wagon drive on it—you shrink back with horror at the rashness that could trust so frail a structure at that dizzy height—but the air-hung cobwebs sustain the pressure, and the vehicle passess in safety. Indeed, weight steadies while the wind, as it sweeps down the gulf, makes it swing under you.—The large suspension bridge is supported on four cables of iron wire, each one composed of 1055 wires. Length of bridge 905 feet, height 174 feet, breadth 28 feet, A span of 905 feet without any intermediate pier, seems impossible at first, and one needs the testimony of his own eyes before he can fully believe it.

Ole Bull's Fiddle.

The instrument played by Ole Bull is dated 1432. It was made at Briaoia, by Gaspare de Salo, and was carved at Rome by the celebrated Benvenuto Cellia for Cardinal Aldobrandini, for which he received 3000 ducats. At the taking of Inspruck, in 1809, it fell into the hands of a soldier, who sold it for 400 florins to Ryzcheek, who was celebrated for his splendid collection of stringed instruments. Ryzcheek, at his death left it to Ole Bull, as a testimonial of his admiration for that great violinist. The bridge of this instrument is formed by two beautifully carved fishes, the zodiacal sign of February. Ole Bull has several valuable violins; among others a Cremona, made in 1712 by Guarnerius, and a Stradivarius, made in 1687, for the King of Spain. The bows of these violins are almost all inlaid with diamonds; one of them has 45 at the end of it. This was a present from the Queen of Sweden and Norway.

Curious Trees and Plants.

In South America, Humbolt found a tree which produced milk, called the cow tree, from which the surrounding inhabitants regularly obtained supplies of that delicious fluid. In other places are plants and trees that distil water. A traveller in the tropical forests of America, says he must have perished with thirst, had it not been for the *Tilandsia*, or wild pine, a parasitical plant which clings upon trees, whose joined leaves collected at their bases yield large quantities of water.—The *Nepenthes* of India not only furnished water in its leaves, which have pitchers at their extremities, but also covers, to prevent the water from evaporatiug.

A remarkable Fact.

The sea birds, the pulfin, gulliemot and the razor bill, cannot fly over the land at all, although they can rise from the surface of the sea with perfect facility, mount to an indefinite height, and fly with amazing rapidity so long as the sea is immediately under them, but no sooner do they fly above ground than they drop as if shot. During a strong wind from the sea it not unfrequently happens that these birds in mounting higher than the edge of the cliff, are suddenly blown over the land, when they immediately fall, and can only regain their natural element by crawling to the edge of the precipice, when new vigor seems to inspire them, and they at once soar away with their usual velocity.

Tarantulas.

These horrid spiders—the most repulsive of all reptiles—are found among the cane brakes near the lakes of Louisiana. They are of the most venomous kind, and are from three to four inches in diameter. Their net when spread is strong enough to catch and hold sparrows and other small birds, which being thus ensnared, are eaten by the savage proprietors.

The Magnetic Telegraph.

Dissertation by Elihu Burritt, the Learned Blacksmith, now in England.

What imagination can contemplate that mysterious agency of man's invention without being awed into reverence before Him who made man so wonderfully and fearfully. in endowing him with a capacity to work out such wonderful and fearful things? As much as any one have we familiarised our imagination with the prospective possibility of human mind. As sanguinely as any one have we believed in great things to be achieved away ahead in the geometrical series of human nature. But the Magnetic Telegraph arises like an extra mundane column, to testify and terminate the farthest reach of finite minds. Our imagination dares not look beyond this monument of human genius for new conquests, or cannot in our imagination, even reach this, without a feeling of awe, as if treading within the fearful jurisdiction of Omnipotence. Still we cannot believe that it was profane in man to suborn this agency into his service. Was it not left in his way by Him who created it, and man, too, "a little lower than the angels?" It is awful to think of, and we think of it most reverently; but speaking of angels in these inspired terms of comparison, suggested almost an advantage on the part of man in connection with the wonderful medium for the transmission of thought. In the night visions of the mind, this apparition has crossed the disk of our imagination. It might be sinful—we fear it was, but we must make a clean bosom of it.

We conceived that man had webbed the earth with a net work of his magnetic wires: so that in the twinkling of an eye, he could thrill its entire surface, and all that dwell thereon with an unwhispered thought of the heart. And we fancied that he was standing at the grand junction battery of all these lightning lines, the Archangel, who had taken down his trumpet to proclaim through the world, that time should be no more, before he should put it to his lips, approached man, und touching his diadem, as to a compeer, thus addressed him "Human brother, the Great Father of Spirits hath made thee but little lower than the angels. In one respect he hath given thee eminence over Gabriel himself, and that respect the Angel of the trumpet bows to thee. * I am sent to announce the end of time to all that dwell upon earth.—With this trumpet I can blow a blast that shall fill the circumference of eternity with the voice of the summons. But I may not alter the laws which the Planter of the Ear and the Creator of the Air hath prescribed to sound. Days would elapse before the trumpet's voice could make the circuit of the globe. Our Omnipotent Father hath endowed thee with a quicker speech than 'Kol Elohim,' or the slow travelling thunder. Charge thy battery and thy netted wires with my awful message to mankind, that all the eyes of living men may read its summons in the same moment of time. Do this, for God hath made thee a fellow servant with me to do his will."

Has our imagination ventured too far in this conception? We fear it. Perhaps we mistook the angel that stood by man at the grand junction battery of these lightning-lines. Yes, we were wrong; it was not Gabriel; it was the angel of the other trumpet—the one John saw flying through the midst of heaven with the everlasting gospel of Peace! Peace! on earth and good will to men. Yes, it was the angel of the rainbow diadem, descending amid the choral allelulias, to proclaim that God hath made of one blood, and for one brotherhood all nations of men. That was the angel and this the message which shall thrill simultaneously the net-work of these magnetic wires, in which coppery eyed Mammon is pursuing the earth to fill its greasy purse with lucre of the guinea's stamp. We are not dealing in fancy; they are stretching these lightning lines over continents already. They are trailing them over the coral beds of the seas; down, down among the black skeletons of Phœnician argosies, shipwrecked on a Columbus voyage to Britain, and all others that for three thousand years, have gone down unrecorded in the English Channel and the Straits of Dover. Paris and London will soon be brought within the same whispering gallery, and the 'natural enmity' between the two nations be lost forever in the unbroken current of friendly conference, in the local identity, which these message wires shall work out for them. On, on, they are stretching the lightning train of thought; onward to the extremest Inde, over seas and deserts that have swallowed up navies and armies: knitting the ends of the earth together, and its inhabitants too, in the consentaneous sympathies, bringing the distant and half-explored continents of humanity with all their tribes and tongues, and colors and conditions, within the converse of an hour. Think of that for a moment! Compressing the solid earth, of twenty-four thousand miles in circumference, into a social circle of a dozen furlongs in girth. If Christianity keeps pace with Commerce, will there not be a glorious brotherhood, a nice family circle of mankind, by the time these literary lightnings shall be mounted and running to and fro over the whole earth!

Examples of Modern Syntax.

A New York paper announces the wrecking of a vessel near the harrows, says: "The only passengers were T. B. Nathan, who owned three-fourths of the cargo and *the captain's wife*."

The editors of a western paper observe: "The poem we publish in this week's Herald, was written by an esteemed friend who has been *many years in the grave for his own amusement*."

The editor of an eastern paper expresses great indignation at the manner in which a man was buried who committed suicide. He says: "He was buried like a dog with his clothes on."

It is stated in English papers, that a chimney *four hundred and ninety-five* feet high, is nearly completed at Wigans; and another 345 feet high at Edinburgh.

THE NEW YORK
SCIENTIFIC AMERICAN:
Published Weekly at 128 *Fulton Street.*,
(*Sun Building,*) *New York.*

BY MUNN & COMPANY.

The SCIENTIFIC AMERICAN is the Advocate of Industry and Journal of Mechanical and other Improvements: as such its contents are probably more varied and interesting, than those of any other weekly newspaper in the United States, and certainly more useful. It contains as much interesting Intelligence as six ordinary daily papers, while for *real benefit*, it is unequalled by any thing yet published Each number regularly contains from THREE to SIX ORIGINAL ENGRAVINGS, illustrated by NEW INVENTIONS, American and Foreign,—SCIENTIFIC PRINCIPLES and CURIOSITIES,—Notices of the progress of Mechanical and other Scientific Improvements, Scientific Essays on the principles of the Sciences of MECHANICS, CHEMISTRY and ARCHITECTURE,—Catalogues of American Patents,—INSTRUCTION in various ARTS and TRADES, *with engravings*,—Curious Philosophical Experiments,—the latest RAIL ROAD INTELLIGENCE in EUROPE and AMERICA,—Valuable information on the Art of GARDENING, &c. &c.

This paper is especially entitled to the patronage of MECHANICS and MANUFACTURERS, being devoted to the interests of those classes. It is particularly useful to FARMERS, as it will not only apprise them of IMPROVEMENTS in AGRICULTURAL IMPLEMENTS, but INSTRUCT them in various MECHANICAL TRADES, and guard against impositions. As a FAMILY NEWSPAPER, it will convey more USEFUL Intelligence to children and young people, than five times its cost in school instruction.

Being published in QUARTO FORM, it is conveniently adapted to PRESERVATION and BINDING.

TERMS.—The Scientific American is sent to subscribers in the country at the rate of $2 a year, ONE DOLLAR IN ADVANCE, the remainder in 6 months. Persons desiring to subscribe, have only to enclose the amount in a letter, directed to

MUNN & COMPANY,
Publishers of the Scientific American, New York.

☞ Specimen copies sent when desired. All letters must be POST PAID.

© 1846 SCIENTIFIC AMERICAN, INC